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A study of the barriers to institutionalization of Total Quality Management (TQM) in the Department of Defense acquisition process

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THESIS

A Study of the Barriers to Institutionalization of Total Quality Management (TQM) in the Department of Defense Acquisition Process

by

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A STUDY OF THE BARRIERS TO INSTITUTIONALIZATION OF TOTAL QUALITY MANAGEMENT (TQM) IN THE DEPARTMENT OF DEFENSE ACQUISITION PROCESS

by

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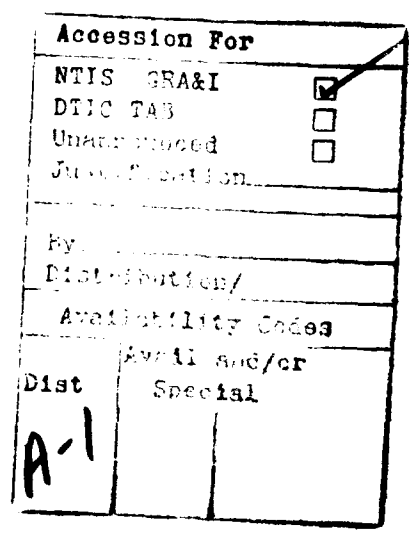
This thesis research focused on the identification and characterization of the barriers which impede institutionalization of Total Quality Management (TQM) concepts in the Department of Defense (DoD) acquisition system. Barriers were identified and characterized by survey of public and private sector individuals knowledgeable about TQM and experienced in the DoD acquisition system. The quality philosophy described by Dr. W. Edwards Deming was the primary foundation for analysis. Although many barriers were identified, the research analyzed the top six barriers identified by respondents. In order of precedence, they were: *Management Willingness to Change*, the *Competition in Contracting Act of 1984*, *Congressional Oversight*, *DoD Acceptance and Inspection Procedures*, *Single Year Budgeting*, and *Management Mobility*. Major conclusions were: (1) Institutionalization of TQM involves a cultural shift in how managers view leadership, (2) Barriers rooted in statute or regulation demand leadership's attention, (3) A prerequisite for command positions must include a profound understanding of total quality, (4) The political environment that influences the DoD acquisition system, also affects DoD's ability to institutionalize total quality, (5) Enhancement of Government customer and contractor supplier long term relationships is required if total quality is to be institutionalized within DoD.



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I. INTRODUCTION

A. GENERAL

The Executive Branch, particularly the Department of Defense (DoD), has officially adopted Total Quality Management (TQM) as the philosophical and practical guiding principles by which it will manage resources in the 1990's and hence into the next century [Ref. 1:p. 1-2]. Some of the baseline principles of TQM fly in the face of traditional government and military acquisition management approaches [Ref 2]. Since DoD has adopted TQM as the management style of the future, there must be significant enhancements that TQM can bring to the management of DoD, one of the most complex public organizations in the world. The TQM approach is fundamentally different, yet high level managers are embracing and implementing the new philosophy with ever increasing enthusiasm.

TQM, as DoD has adopted it, is in essence the concept and organizational management philosophy espoused by Dr. W. Edwards Deming. While the term, "Made in Japan", once invoked images of flimsy construction and poor quality, today it represents quite the reverse. Companies who have not achieved world class success utilizing traditional American business practices are now converting to new management philosophies similar to Deming's. For U.S. companies who have transformed their companies utilizing TQM-like work ethics, the story is *not* one of declining profits and market share. These companies are now associated with high product quality standards and there is the potential for rebounding in

the market. Share of the market grows as an inherent outgrowth of the living out of the TQM philosophy and prosperity increases. Prosperity does not mean that companies who adopt TQM-like principles are getting rich at faster rates. It means that they are goal oriented towards staying in business, providing a reputable product or service to the public, while maintaining employment and a happy and motivated work force.

DoD's shift in management philosophy is necessary to maximize its management of resources, improve the quality of military capability with declining force structures, and improve the public's perception of the value of spending taxpayer dollars for advanced armed forces. Within the Federal Government, and specifically within DoD, there is a perception that TQM concepts are difficult to tailor for appropriate application within the all encompassing acquisition process (for use by DoD and defense contractors). Often statutory law and departmental regulations are cited as impediments to TQM implementation and utilization in the acquisition of hardware, goods, and services.

B. OBJECTIVES OF THE RESEARCH

The purpose of this research is to identify and rank barriers which impede institutionalization of TQM principles in the DoD acquisition process. Along with identification of the impediments (or barriers), the purpose is to understand the nature of these barriers, and to determine if these barriers are internally or externally controllable by DoD (e.g., to what extent are the barriers linked to Government laws, regulations, or internal DoD policies). Finally, this research seeks to present options regarding how the barriers to using TQM in the DoD acquisition system might be overcome.

C. RESEARCH QUESTION

Given the preceding objectives, the following primary research question was posed: What Federal procurement statutory, regulatory and policy barriers exist which prevent or impede the ability of the Department of Defense to embrace Total Quality Management (TQM) concepts in the acquisition process and how might these barriers be overcome?

The following secondary research questions are deemed pertinent to this research effort:

1. What is the concept of TQM, principally as approached by Dr. W. Edwards Deming? What is DoD's concept?
2. How does TQM differ from traditional management concepts currently practiced by DoD?
3. What statutes, regulations, policies, or work ethics act as the most significant impediments to institutionalizing TQM concepts in the DoD acquisition process?
4. How might the impediments or barriers be reduced or eliminated?

D. SCOPE AND LIMITATIONS

The purpose of this research is to determine which Deming/TQM concepts conflict with current acquisition statute requirements, regulation requirements, and policy provisions. The intent of the research is principally to identify barriers and explore the nature of those barriers in relation to Deming's new quality philosophy. The objective is not to explore how each conflict might be resolved in a detailed manner, but rather to pose solutions as they appear evident, or recommended by those questioned in the data gathering process.

E. METHODOLOGY

The methodology employed in this research consisted of the following components: (1) examination of the literature base, (2) survey of DoD and defense industry high level acquisition managers with significant TQM knowledge and experience, (3) follow-up interviews with selected survey individuals, and (4) researcher attendance of Dr. Deming's Quality, Productivity and Competitive Position Seminar.

F. ORGANIZATION OF THE THESIS

This thesis is organized into six chapters. The first chapter is an introduction to the thesis. Chapter II provides background information regarding the concept of TQM as espoused by Dr. Deming and DoD. The background chapter provides an understanding of Deming's concept of "profound knowledge" and attempts to show how Dr. Deming's approach is fundamentally more in depth than DoD's approach at this point in time. The third chapter presents the methodology used to gather data and demographic information concerning survey participants. Chapter III also provides some of the results related to demographical information. Chapter IV presents the survey data regarding barrier identification and ranking. The fifth chapter provides the survey respondents characterization of the top barriers and is also the researcher's analysis of the top barriers. The researcher's analysis is primarily based on the principles taught by Dr. Deming and other Deming associates. Chapter VI presents the researcher's conclusions and recommendations.

II. BACKGROUND

A. INTRODUCTION

The traditional method to ensure a quality product or service in American industry has been to pay more for "higher quality" or "inspect in" quality. In the U.S., the customer has been disappointed by industry's level of quality and has looked to foreign sources as the benchmarks for what once was without question a major U.S. strength [Ref. 3:p. iii-xi].

Within the Defense acquisition system, the option to depend on off-shore weapons development and hardware solutions is not a viable alternative for support of the entire defense establishment for many reasons. Thus, without foreign competition in the Defense acquisition system there is not the same influence as can be found in the commercial environment to hold costs down while delivering quality products.

Competition initiatives within the defense acquisition system have perhaps reduced the pace at which costs have been escalating since the late 1970's, but still DoD is criticized by the public and the Congress for buying unreliable systems at tremendous cost to a seriously leveraged Government treasury [Ref. 3:p. i-ii].

This problem of declining quality, rising costs, and poor public perception is not new. Much of the initiative to improve the defense establishment's downward trend has been in reform of acquisition regulations and policies, both from within DoD, and externally from Congress. The list of studies, commissions, and reports involving DoD acquisition practices has become quite lengthy [Ref. 4].

Lawmaking and regulating by taking one acquisition problem at a time has not seemed to work in attempting to improve the acquisition system as a whole. A highly complex "system" of acquisition, intended to control and incentivize DoD managers and defense contractors, has evolved into a maize of laws, regulations, policies, initiatives, and studies, with change upon change to the acquisition system [Ref. 5:p. 43].

Emerging from this maize appears to be a major change in the "culture" of how the defense establishment conducts business. The culture of continuous improvement is DoD's umbrella under which the acquisition reform will occur. The solution, therefore, is more than changing the *status quo*. It is an evaluation and improvement of the entire system, given a set of TQM guidelines.

The following discussion focuses on the foundations of those guidelines as espoused by Dr. W. Edwards Deming and the DoD.

B. THE DEMING CULTURAL CONCEPT

Dr. W. Edwards Deming is well known as the statistician who greatly influenced the recovery of Japanese industry during the post WW II era. In 1980, he became known in the United States, after NBC television produced a documentary program citing Deming's contributions to Japanese industry [Ref. 6:p. 3]. His most widely known philosophies regarding guiding principles for business are held in his now famous, "14 Points" and the "Deadly Diseases". One of the earlier versions of Deming's 14 Points introduced in the military was distributed on cards at a Deming User's Group meeting in February 1985 in San Diego. The card was printed by Naval Air Rework Facility, North Island (now the Naval Aviation Depot) [Ref. 7:p. 43].

The DoD has not explicitly named Dr. W. Edwards Deming's 14 Points and the Deadly Diseases as the foundation that supports DoD's TQM initiative, nor does Dr. Deming call his philosophy TQM. However, to most DoD TQM proponents, Dr. Deming's management philosophies are acknowledged as the fundamental standard and the backbone of the DoD effort.

1. Dr. W. Edwards Deming's 14 Points and the Deadly Diseases

Below are listed the 14 points and deadly diseases. They represent the fundamental precepts of the new management philosophy (principles for transformation). Dr Deming has revised his 14 Points numerous times over the years in order to emphasize the trends he sees as obstacles to quality and productivity [Ref. 7:p. 42]. The 14 points and deadly diseases apply to every type of business, i.e., production companies, service sector companies, and the public sector (government services) [Ref 8:p. 23]. Essentially, the philosophy applies to any enterprise that has customers. TQM is customer oriented. Since DoD does have a product and service which it provides to the nation, TQM can apply to the operation of the defense system in the U.S.

The 14 Points (1 Oct 90 version) [Ref. 9]:

1. *Create and publish to all employees a statement of the aims and purposes of the company or other organization. The management must demonstrate constantly their commitment to this statement.*
2. *Learn the new philosophy, top management and everybody.*
3. *Understand the purpose of inspection, for improvement of processes and reduction of cost.*
4. *End the practice of awarding business on the basis of price tag alone.*
5. *Improve constantly and forever the system of production and service.*

6. *Institute training (for skills).*

7. *Teach and institute leadership.*

8. *Drive out fear. Create trust. Create a climate for innovation.*

9. *Optimize toward the aims and purposes of the company the efforts of teams, groups, and staff areas, too.*

10. *Eliminate exhortations for the work force.*

11. *(a) Eliminate numerical quotas for production. Instead, learn and institute methods for improvement.*

    (b) Eliminate M.B.O. (Management by Objective). Instead, learn the capabilities of processes, and how to improve them.

12. *Remove barriers that rob people of pride of workmanship.*

13. *Encourage education and self-improvement for everyone.*

14. *Take action to accomplish this transformation.*

In addition, Dr. Deming points out the Deadly Diseases which impact on the success or failure of implementation of the Fourteen Points [Ref. 6:p. 36][Ref 8:p. 97-98]:

1. *Lack of constancy of purpose to plan product and service that will have a market and keep the company in business, and provide jobs.*

2. *Emphasis on short-term profits.*

3. *Evaluation of performance, merit rating, or annual review.*

4. *Mobility of management; job hopping.*

5. *Management by use only of visible figures, with little or no consideration of figures that are unknown or unknowable.*

6. *Excessive medical costs.*

7. *Excessive costs of liability, fueled by lawyers that work on contingency fees.*

2. A System of Profound Knowledge

Those less knowledgeable about TQM often evaluate the depth of understanding required for this new quality philosophy as only Dr. Deming's 14 points. To truly understand TQM, it must be studied and internalized first within individuals and then the organization.

In recent writings, Dr. Deming has discussed his concept of the *System of Profound Knowledge* that is necessary to change the traditional management approach to a style of management by optimization. He states that an individual does not have to be "eminent" in any of the four parts of the System of Profound Knowledge in order to grasp the concept and apply it, but an understanding of each area and how they interrelate will lead to a system of optimization [Ref. 10:p. 10].

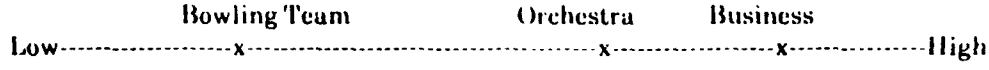
An outgrowth of the understanding and application of the system of profound knowledge is that "The 14 points for management in industry, education, and government follow naturally..." [Ref. 10:p. 11]. The four parts to the *System of Profound Knowledge* are as follows:

- *Appreciation for a system*
- *Statistical theory (theory of variation)*
- *Theory of knowledge*
- *Psychology*

A manager must recognize that the four points above interact with each other and that an understanding of them is necessary in order to optimize the overall aim of the organization.

a. **Appreciation for a System**

Dr. Deming depicts a business organization as analogous to an orchestra. A good orchestra functions cohesively as a team in order to please the listener. Each member of the orchestra is there to support the other members, therefore there is a large degree of interdependence in order to achieve the aim. [Ref 10:p. 15]



Degree of Interdependence

Although members of an orchestra may practice separately under different instructors, they do not all play solos at the same time. Just as an orchestra has a conductor, a business must have leaders who manage with optimization as the aim of the organization. Dr. Deming writes:

> The performance of any component is to be judged in terms of its contribution to the aim of the system, not for its individual production or profit, nor for any other competitive measure. Some components may operate at a loss to themselves, for optimization of the whole system, including the components that take a loss. [Ref 10:p. 15]

> Any system that results in a win, lose structure is suboptimized [Ref 11].

> Optimization of a system should be the basis for negotiation between any two people, between divisions, between union and management, between competitors, between countries. Everybody would gain. [Ref 10:p. 16]

The two greatest forces of failure to optimize a system are, (1) failure to evaluate the consequences of short-term performance, and (2) failure to optimize human resources. Ranking people induces conflict. Optimization of the system is destroyed by these forces, claims Deming. [Ref 10:p. 17]

A system must have guidance from external sources in order to facilitate the instruction of profound knowledge. In the orchestra example, a master musician may be called upon to assist the members of the orchestra to function more effectively as a whole.

"Precise optimization is not necessary", nor would it be easy to define, writes Deming. According to the Taguchi loss function, a system needs to come close to the point of optimization, not precisely to that point in order to achieve the desired optimization [Ref 10:p. 18]. Deming believes that it is management's job to "come close to the point of optimization and stay there" [Ref. 11]. See Figure 2-1.

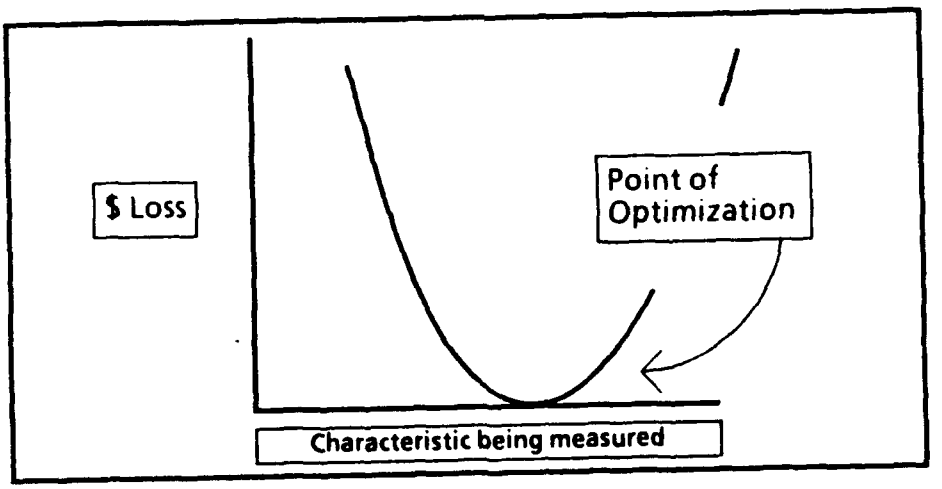


Figure 2-1 The Taguchi Loss Function

b. Knowledge of the Theory of Variation (Statistical Theory)

Managing a system must include the knowledge of what a stable system is, variation, and the causes of variation (common causes and special causes). This includes the variation found in processes, systems, and people [Ref. 10:p. 18].

Deming was instrumental in the U.S. industry's use of statistical process control (SPC) during the war production effort of the early 1940's. When the war ended, SPC lost its stature as a key production tool when quality began to take a back seat to mass production of consumer goods. During that period of America's history, there was no foreign competition for the goods the U.S. had to offer [Ref. 6:p. 7-8]. Without top management support for continuous improvement, SPC did not survive [Ref. 8:p. 324].

In regard to understanding a stable system, it should be noted that it will exhibit some fluctuations caused entirely by random variation. These variations are called common causes. Special causes of variation, on the other hand, will cause the system to operate in an unstable manner. In a stable system, all of the special causes of variation have been eliminated. For instance, absenteeism, a common governmental concern, may exhibit the characteristics of a stable system if absentees are within a certain range over a period of time. Special causes of variation may affect absentees, thereby indicating that absentees are above or below what is normally expected. If the system is stable, then only management can improve the output of that system [Ref. 8:p. 325]. In order to improve a stable system, management must take some action to improve the

overall system. Common causes are of a systemic nature, and only management can change the system.

c. Theory of Knowledge

The Theory of Knowledge, as it applies to an individual's appreciation, for a System of Profound Knowledge is the acknowledgement that decisions based on experience, exclusive of theory, will ultimately yield suboptimization. Conversely, there is no understanding of the system if decisions are based solely on theory and devoid of experience. [Ref. 10:p. 21]

A foundation of the difference between common cause problems and special cause problems is also necessary. As expressed above, a common cause problem is a problem that is inherent in the system, whereas problems attributed to special causes are related to individual events. Deming estimates that 94% of the problems are caused by the system, whereas 6% are caused by special events. Common cause failures are the responsibility of management. [Ref. 8:p. 314]

A system managed by individuals who do not have an understanding of theory, may rely on their "experience" to correct problems. Without an understanding of the theory, the system will not be improved inasmuch as the management is unable to distinguish between common and special causes. [Ref. 8:p. 317]

d. Knowledge of Psychology

The Knowledge of Psychology applies to the effectiveness of leadership. Without an understanding of behavior, and each person's "innate need for self esteem and respect", leadership will not be effective in bringing out the *intrinsic motivation* that each person is born with [Ref. 10:p. 9].

Extrinsic motivation is submission to external forces that neutralize intrinsic motivation. Pay is not a motivator. Under extrinsic motivation, learning and joy in learning in school are submerged in order to capture top grades. On the job, joy in work, and innovation, become secondary to a good rating. Under extrinsic motivation, one is ruled by external forces. He tries to protect what he has. He tries to avoid punishment. He knows not joy in learning. *Extrinsic motivation is a zero-defect mentality* [Ref. 10:p. 24]. (Researcher emphasis.)

Deming emphasizes that it is the responsibility of leaders to understand the difference between intrinsic and extrinsic motivation...to understand that not all people are alike. Management's decision to make changes to improve systems must include a knowledge of what truly motivates and gives joy to people in their work. He also warns that, "removal of a demotivator does not create motivation" [Ref. 10:p.22]. The following examples from Deming are illustrative of the point:

Forces of Destruction of Intrinsic Motivation [Ref. 10:p.26]

- Grades in School - Gold Stars for Athletics.
- Merit System. Judge people; put them into slots. Competition between people, groups, divisions.
- Incentive Pay. Pay for performance.
- M. B. O. and management by the numbers.
- Business plans with reports on monthly or quarterly targets.
- Quotas for production, daily or weekly.
- Suboptimization. Demanding that every group, every division, show a profit.

Just removing these forces of destruction are not enough, they have to be replaced with leadership. Deming states:

> One is born with intrinsic motivation, self-esteem, dignity. He inherits joy in work, joy in learning. These attributes are high at the beginning of life, but are gradually crushed by the forces of destruction. These forces rob people, and the nation, of innovation and applied science. We must replace these forces with leadership that will restore the power of the individual [Ref. 10: p. 26].

Deming's philosophy and DoD's *traditional* management modus operandi are in conflict, though. Why is it so hard for DoD manager's to adopt TQM principles? DoD has attempted to change the system by mandating TQM as the management philosophy that DoD will manage by. It is not that simple. The problem begins with how U.S. managers view the environment that they manage in. Dr. Kosaka Yosida, a long time student of Dr. Deming's, makes the comparison between the traditional American management style and the Japanese management philosophy. He states that in America there is more tolerance for variation in a system, whereas in the Japanese culture there is a clear notion of what comprises desirability. Below is a comparison of the Japanese, "whole-istic" view of management and the American, "analytic" approach to management as described by Dr. Yoshida [Ref. 12]:

Holistic Thinking	Analytic Thinking
Total is more than the parts	Individual parts are separate
Cooperation	Competition
Desirability	Acceptability
Taguchi Loss Function targets	Specification limits
Continuous Improvement	Zero Defects
System variation control	Ranking
Team design	Secret design

Corporate constancy of purpose	No specific purpose
Long run vision	Short run goals
Deming's 14 Points	Management by Objective
Permanent commitment	Replacement

Dr. Yoshida describes these two types of thinking by saying that holistic thinking starts with a target of optimization and as one moves away from that optimum point of desirability, the desirability becomes gradually less and less. Analytic Thinking establishes a range of acceptability, beyond which is unacceptability [Ref. 11 and Ref. 12:p. 3]. See Figure 5-2, below. Customers understand the concept of desirability, but supplier management has failed to optimize desirability of products and services, thus customers go elsewhere.

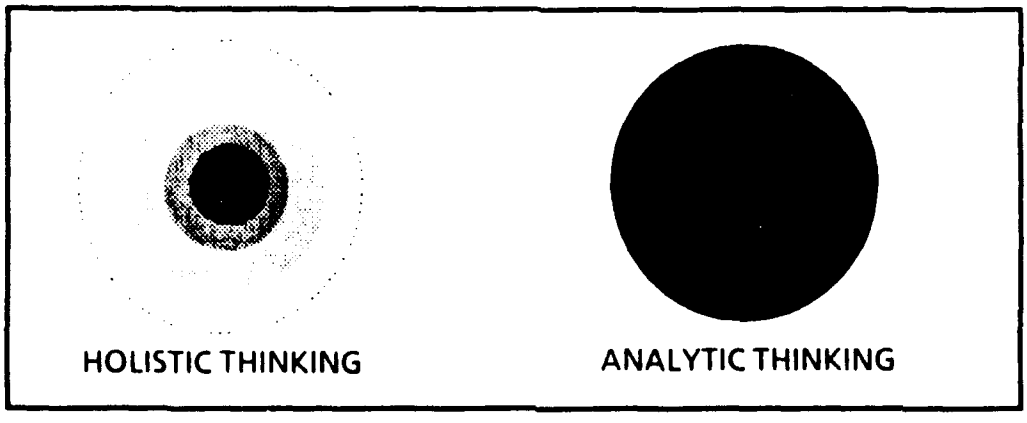


Figure 5-2 Holistic vs. Analytic Thinking

How will DoD management begin to think "whole-istically"? The answer lies in DoD's ability to teach its managers an understanding of profound knowledge.

Dr. Deming describes prevailing management practices as the walls of a prison. The managers are in a prison created by their own management practices.

> The prevailing practice of management came from theory that grew up 50 to 100 years ago. The world has changed: the theory of long ago no longer works. The practices of management that were our strength 50 to 100 years ago have today become the walls of a prison [Ref. 11].

The walls of the prison are succinctly given as follows: [Ref. 11]

- Short term planning.
- Ranking people, teams, divisions. Ranking causes conflict and competition.
- Management by results. Taking management action on symptoms, not root causes. "A mind is not required for this kind of management". "Costs are not causes: costs come from causes".
- Confusion regarding the differences between common causes and special causes. (Tampering).
- Work standards and quotas.
- Management by numbers. ("Do it; I don't care how you do it; just do it".)
- Spending inordinate amounts of time fighting fires.

In order to break down the walls of the prison, Dr. Deming states that change must be actively led by management who understands the transformation necessary. He says that management must understand profound knowledge.

A leader today must understand the limitations of the old theories and the practices of management that they led to. A leader of today must adopt a theory for today's world, and must develop an appropriate system for management of his theory. The theory that he requires is knowledge about a system and optimization thereof. [Ref. 11]

3. SUMMARY OF THE DEMING NEW QUALITY PHILOSOPHY

Some critics of TQM say that Deming's thoughts apply only to production applications. It is widely held by Deming and his quality associates that the notion that TQM applies only to production processes is false. The new quality philosophy applies to any system that has a product and customers. With regard to government service, Deming states:

In most governmental services, there is no market to capture. In place of capture of the market, a governmental agency should deliver economically their service prescribed by law or regulation. The aim should be distinction in service. Continual improvement in government service would earn appreciation of the American public and would hold jobs in the service, and help industry to create more jobs. [Ref. 8:p. 6]

In order to determine whether or not the new quality philosophy is a good fit for utilization in the DoD acquisition system, there must be an understanding of Dr. Deming's 14 points, the deadly diseases, and the theory of profound knowledge. The theory of profound knowledge determines that all management must have a baseline of understanding regarding appreciation for a system, statistical theory, theory of knowledge, and a fundamental understanding of human nature (psychology).

C. TQM AS ADOPTED BY THE DEPARTMENT OF DEFENSE

TQM and Deming's philosophy are not synonymous [Ref 12:p. 3]. The DoD's definition of TQM does not expressly espouse the Deming concept of quality improvement. However, much of the concepts provided by Deming are outlined in DoD's recent Total Quality Management Guide (Volumes I and II). It is very difficult to define TQM in an encapsulating paragraph. DoD's most common definition of TQM is as follows:

> Total Quality Management (TQM) is both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization. TQM is the application of quantitative methods and human resources to improve the material and services supplied to an organization, and the degree to which the needs of the customer are met, now and in the future. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous improvement. [Ref. 13:p. 1]

If a novice to the new philosophy took this definition at face value and did not digest the supporting information that DoD provides in the TQM Handbook, then that individual would probably come away thinking that TQM is nothing new. DoD's definition "integrates fundamental management techniques" to accomplish TQM. DoD's literature regarding TQM is not entirely clear as to which management techniques are no longer appropriate. Deming boldly states, "Focus on outcome (management by the numbers, zero defects, appraisal of performance) must be abolished, leadership put in place" [Ref. 5:p. 54]. Deming is clear about which management practices are not compatible with the new quality philosophy.

Specifically, DoD has not established a position regarding performance appraisals and the long term buyer-supplier relationship as called out by Deming

in his 14 Points and Deadly Diseases. This does not mean that there is no effort underway to address these barriers, only that DoD's TQM concept cannot presently embrace these two areas due to external pressures.

One journalist's statement reflects the inherent desire of the general population to reach a workable definition:

> Despite TQM's high visibility throughout the department, DoD has adopted no official definition. DoD literature typically refers to it as a management approach focused on continuous process improvement. [Ref. 14:p. 9]

The DoD would likely contest this statement by stating that its philosophy is a combination of Deming, Juran, Fieguenbaum, Ishikawa, and Taguchi [Ref. 13]; very much in line with Deming's philosophy except for the issues of performance appraisals and long term relationships between the DoD and its suppliers. (The Competition In Contracting Act of 1984 mandates full and open competition of all procurements with very few exceptions). However, DoD *has* adopted an approach that is very distinct from its traditional management practice within the department.

The Undersecretary of Defense (Acquisition), the Honorable John A. Betti conveys his conceptualization of TQM as four basic pillars [Ref 15:p. 6-7]:

> Customer. The customer is the focus of everything we do. We must be customer-driven. The objective is to anticipate, meet and to exceed customer wants and needs. This includes both the external and internal customer.

> Quality. Quality is defined by the customer. Quality must be the #1 priority of the enterprise. Quality takes precedence over all other considerations, including cost and production schedules.

> Continuous Process Improvement. It's a fact of life that customer expectations will continue to rise and we must continue to improve in anticipation of that fact. Durable improvement can only be obtained by focusing on the process, not the product. By the time a product exists. it's too late for anything except inspection and remedial action. It's axiomatic that a high quality process will yield a high quality, lower cost product or service.

> People are the most important ingredient of any process. Unless they share common goals, have a common vision of success and are willing, as a team, to devote their minds and energies to their achievements, the enterprise will fail.

Secretary Betti also states that along with these pillars, the key ingredients for successful implementation of TQM within DoD are: Understanding the Concept, Commitment, Alignment, and Focus on Root Causes.

It is important to note that Betti's remarks reflect the substance of profound knowledge that Dr. Deming stresses. Betti does emphasize that to some, TQM may be just another slogan, but to him it is not. He states, it will require "dedication, education, and patience" in order for TQM to make fundamental improvements in DoD[Ref. 15:p. 8].

Laurie A. Brodeling, Deputy Under Secretary of Defense for TQM indicates that DoD is making headway in instituting TQM:

> Leadership in DoD is actively formulating plans for Total Quality Management in the next few years. The challenge that lies ahead in changing our culture is daunting. However, there is no doubt that we have a critical mass of senior leaders who are actively deploying this approach. The defense establishment and our industry partners have achieved a degree of maturity in growing Total Quality Management into a viable, operating acquisition management concept. We are beginning to "walk our talk" [Ref. 16:p. 7].

Indeed, there are many indications that DoD is making headway in implementing TQM in the acquisition system. Deming himself stated this to the researcher at a four day seminar [Ref. 11]. Again, the aim of this research is to expose those barriers that are most significantly blocking long run success of full implementation and institutionalization of TQM in the DoD acquisition system.

III. METHODOLOGY

A. INTRODUCTION

A questionnaire was used to identify, rank, and characterize those elements considered to be barriers to fully implementing TQM in the DoD acquisition system.

The first objective of the questionnaire was *identification* of perceived barriers to TQM within the acquisition system, the *significance* of those barriers, and the respondents' recommendations regarding the *elimination* of those barriers.

The second objective of the questionnaire was to gather the respondents' perception regarding the *degree of control* for influencing change to eliminate those barriers, e.g., how easily might the barrier be eliminated (by DoD internally). Therefore, an effort was made to determine if the identified barriers were mostly influenced by Government laws or regulations, internal policy, or neither.

The purpose in utilization of a questionnaire was not to allow statistical analysis of the responses, i.e., a nonstatistical sampling approach was employed. The questionnaire is presented in Appendix A.

B. QUESTIONNAIRE STRUCTURE

The questionnaire was comprised of the the following subparts (see Appendix A for detailed survey format):

Section I Demographics

Section II Barrier Identification

Section III Barrier Ranking

Section IV Top barrier Open Explanation

The survey focused on the ranking (significance) of the barriers, and a characterization of the respondent's top 2 barriers in the Top Barrier Open Explanation (Section IV of the questionnaire).

C. SOLICITATIONS, RESPONSES, AND DEMOGRAPHICS

1. Solicitation

Approximately 65 questionnaires were mailed to individuals the researcher had gathered from various recommended sources, the Joint OSD - Air Force- Industry Study of June 1989 [Ref. 2], and sources found in the quality management literature. The objective was to obtain responses from high level/experienced acquisition managers (from both DoD and industry) who also possessed an in-depth knowledge of TQM concepts.

2. Responses

There were 32 responses to the questionnaire. Two responses were received after the cutoff date but were not included in the analysis. The response rate of approximately 50 percent was considered successful, and is perhaps attributable to the high interest that acquisition managers have in improving the acquisition process and system through adoption of TQM principles.

3. Demographic Data

The following demographic data reflect the average acquisition experience as indicated by each respondent, the number of governmental and industry respondents, the respondents' familiarity with TQM concepts, and a listing of the job title profiles of the respondents.

a. Average Acquisition Experience

Each respondent provided the number of years of acquisition experience in order to gain an understanding of the degree of the respondent's familiarity with DoD's acquisition system. The term *acquisition* was not defined in the questionnaire, therefore a variety of acquisition experience was received. Some respondents were very familiar with Government laws and regulations regarding acquisition, while others were experienced in commercial buying practices, with some exposure to the specifics of Government law and regulation affecting the DoD acquisition system. Table 3-1 depicts the demographic data obtained from each respondent.

b. Job Title Profiles

In order to convey the high degree of respondent credibility the, researcher feels it important to list the job titles of respondents. See Table 3-2 below.

D. SUMMARY

As depicted in Table 3-1, the sample population consisted of 19 government respondents (59%) and 13 industry respondents (41%). Twelve respondents considered themselves TQM Experts, 16 respondents considered themselves Very Familiar with TQM concepts, and 4 respondents considered themselves Somewhat Familiar with TQM concepts. Each respondent judged himself or herself either an Expert, Very Familiar, or Somewhat Familiar with Deming's philosophy.

The researcher was very much encouraged by the interest shown by respondents. The depth and earnestness of the responses led to the researcher's

YEARS OF ACQUISITION EXPERIENCE

(by level of TQM expertise)

Expert	Very Familiar	Somewhat Familiar
21*	9	17
15*	24	15
28*	27	21
28*	20	5
12	24	
10	12*	14.5 Avg.
15	10*	
1	23	
31*	18	
15*	10	
30*	20*	
11*	20	
	14	
18.1 Avg.	26	
	12*	
	30*	
	18.7 Avg.	

Notes:

1) * denotes DoD industry respondent.

2) There were 19 government respondents (59%) and 13 industry respondents (41%)

3) There were 12 respondents who considered themselves TQM Experts, 16 respondents who considered themselves as Very Familiar with TQM concepts, and 4 respondents who considered themselves as Somewhat Familiar with TQM concepts.

TABLE 3-1

RESPONDENT JOB TITLE PROFILES

Senior Vice President - Well known Quality Management Consulting Firm

Special Assistant to the Director of Engineering

Professor and Consultant - Assistant to Deming

Policy Manager

Director of Technical Data - DoD Systems Command

TQM Coordinator - DoD Systems Command

Professor - Student of Deming for 20 years

Vice President - Group Product Integrity - Large Corporation

Assistant to the Commander for Quality - Large DoD Component Headquarters

Vice President - Reputable Industry Association

Manager of Quality Improvement - Large Company

Professor of Engineering Management - Advanced Degree University

Director of Design Policy

Contracts Division Head

Professor of Contract Administration

Professor of Contract Management - Advanced Degree University

High Level DoD Civilian Appointee

Deputy Assistant Commander for Engineering and Design

Assistant Deputy for Special Projects

Contract Specialist - TQM Liaison for Regional Contracting Center

TABLE 3-2

RESPONDENT JOB TITLE PROFILES (CONTINUED)

Manufacturing Manager
Assistant for Corporate Quality
Director, Contract Policy
Corporate Director for Quality - Large Corporation
Senior Quality Executive - Industry Association
Professor - Director of Business Management Department
Branch Head at Systems Command
Deputy Director for Engineering Design
President of Small (8A) Consulting Business
Procurement Analyst - Intermediate DoD Command
Director, Continuous Quality Improvement - Large Corporation

TABLE 3-2 (CONTINUED

increased understanding of Deming's concepts and their interaction with the acquisition system. It was especially apparent from the expert respondents that they indeed possessed a high level of profound understanding of Deming concepts and the acquisition system.

IV. BARRIER IDENTIFICATION

A. INTRODUCTION

In order to determine which barriers are the most significant towards impeding full implementation of TQM in the acquisition process, barrier identification is necessary as a foundation. As previously discussed in Chapter II, in attempting to improve a system (in this case the DoD acquisition "system"), a determination of special causes and common causes must be made prior to implementing changes to the system. Otherwise the effect of making changes to the system may generate problems, e.g., tampering. It would be perhaps, unrealistic to attempt to bring the entire acquisition process under statistical control in order to determine special and common causes of variation. But perhaps someday the capability will exist to properly measure the effects of new acquisition related statues, regulations, policies, and new programs, with a view to *variation* within the system.

In this section, the objective is to identify those elements that are acting as barriers to implementing TQM principles throughout the acquisition process. It rationally follows that if such barriers cannot be eliminated or effectively reduced, implementation of TQM in the DoD acquisition process may not reach its full potential. Under these conditions, those firms which have successfully embraced TQM are most likely not to be interested in DoD business.

B. SURVEY DATA PRESENTATION

The following Tables depict the opinions of those questioned regarding barrier significance in relation to the other potential barriers. The Tables are categorically presented as follows:

Prior to each table is a descriptive synopsis of data extracted from the respective table The superscript numeral next to each barrier description coincides with the numeric order that the barrier appeared in the survey in Appendix A.

1. Barrier Overview

Table 4-1 depicts the relative significance of each barrier as indicated by the survey respondents in Section II of the survey (Appendix A). The barriers are arranged in descending order with regard to significance; the most significant barrier being first, and so on. Furthermore, the number of *Expert*, *Very Familiar* (VF), and *Somewhat Familiar* (SF) responses are indicated. The ratio of Expert, VF, and SF was 12 : 16 : 4, respectively, as discussed in Chapter III. For Table 4-1,

a weighted points method was used to indicate each respondent's ranking of the barriers. The points assigned to the respondents' answers were as follows:

Points Assigned	Response Category
1	No - Not a Barrier
2	Not Significant Barrier
3	Somewhat Significant Barrier
4	Significant Barrier
5	Very Significant Barrier
6	Insurmountable Barrier

a. Table 4-1 Synopsis

- Table 4-1 indicates that the most significant barrier is *Management Willingness to Change* (127 total points).
- Weighted higher by Experts, but lower on a total points basis is *DoD Specifications.*
- An equal number of Expert points were assigned to *Management Willingness to Change* and *Training* (50 points each).
- *DoD Acceptance and Inspection Procedures* and *CICA* were assigned an equal number of points by Experts (49 points).
- There is a definite split between the first 7, and the last 8 barriers (13 point spread), indicating possibly that the last 8 barriers are by nature of lesser significance.

2. Other Barriers

Because respondents were requested to present additional barriers other than the 15 barriers specifically cited in the survey, it is important to present those additional barriers identified by respondents along with the frequency with which they appeared. Table 4-2 reflects the additional barriers provided by respondents. These barriers are grouped according to either, 1) *Barriers related to Understanding or Education regarding TQM principles*, or 2) *Barriers relating to*

BARRIER OVERVIEW

Weighted Rankings

Barrier Ranking	EXPERT	VF	SF	TOT
[1] Management Willingness to Change	50	61	16	127
[5] DoD Specifications	53	56	11	120
[9] Training	50	55	13	118
[13] Single Year Budgeting	46	57	13	116
[4] DoD Acceptance and Inspection Procedures	49	52	12	113
[2] Competition in Contracting Act of 1984	49	48	10	107
[12] Congressional Oversight	41	60	7	103
[10] Socio-Economic Programs	31	48	11	90
[14] Management Mobility	33	46	6	85
[11] Industry Labor Unions	30	47	6	83
[7] Contractor Cost Recovery Systems	32	37	8	77
[8] Ethics	28	37	10	75
[6] Industrial Base Concerns	25	29	10	64
[3] Buy American	22	33	3	58
[15] OMB Circular A-109	16	23	7	46

TABLE 4-1

Traditional Management or Cultural practices. The barriers are presented as the respondents expressed them. This dichotomy seemed appropriate to the researcher inasmuch as barriers in these categories might be overcome by education or change of management practices. Most likely, both education and management change would be required, however.

3. Top 5 Barrier Rankings

Each respondent was asked to rank the barriers outlined in Table 4-1 into a new category representing the five barriers they perceived to be the most significant. The results of the respondents ranking of the top 5 barriers is represented in Table 4-3.

a. Table 4-3 Synopsis

- Not included (by any respondent) in the Top 5 Rankings was *Industrial Base Concerns*.
- *Buy American*, *OMB Circular A-109*, and *Industrial Base Concerns* were not ranked in the Top 5 by any expert.
- The largest point spread (11 points) was between the highest frequency response (*Management Willingness to Change*) and the second highest frequency response (*DoD Acceptance and Inspection Procedures*).
- The following barrier appeared in the Barrier Identification (Table 4-1), but did not appear in the Top 5 ranking: *Industrial Base Concerns*

4. Top 2 Barrier Rankings

Continuing to narrow the significance of barriers as perceived by the respondents, the Top 2 Barrier Rankings are presented in Table 4-4.

OTHER BARRIERS

Barriers related to UNDERSTANDING or EDUCATION regarding TQM principles	**Frequency**
CONTRACTUAL REQUIREMENTS FOR TQM	*1*
DIFFICULTY IN MEASURING SOME GOVERNMENT OUTPUTS	*1*
PERCEPTION THAT QUALITY COSTS $$	*1*
EASIER TO GO BY THE BOOK	*1*
MANAGEMENT DOES NOT REALLY BELIEVE IN TQM - JUST A NEW TREND	*1*
COOPERATION BETWEEN FUNCTIONAL AREAS	*1*
EDUCATION - NOT THE SAME AS TRAINING	*1*
PRODUCT VS. PROCESS ORIENTATION	*1*
LACK OF SENIOR LEADERSHIP	*1*
UNDERSTANDING	*1*
U.S. ELEMENTARY AND SECONDARY SCHOOL SYSTEMS	*1*
Barriers related to TRADITIONAL MANAGEMENT or CULTURAL practices regarding TQM principles	**Frequency**
UNWILLINGNESS TO ACCEPT RISK	*2*
CONSTANCY OF PURPOSE THROUGHOUT	*2*
ANNUAL APPRAISAL SYSTEMS	*1*

TABLE 4-2

OTHER BARRIERS (CONTINUED)

HUGE SIZE OF DOD & INDUSTRY	*1*
TAMPERING BY MANAGEMENT	*1*
MERIT PAY	*1*
DIFFICULTY IN FINDING A DECISION MAKER	*1*
OVER COMPENSATION OF HIGH LEVEL EXECUTIVES (INDUSTRY)	*1*
LABOR NOT TREATED AS FIXED COSTS (WAGES NOT LINKED TO SUCCESS OF COMPANY)	*1*
BIDDING SYSTEM	*1*
EVALUATION METHODS ON PERFORMANCE OF MANAGEMENT	*1*
RIGID CHAIN OF COMMAND STRUCTURE	*1*
POOR ENVIRONMENT (FEAR, SHOOT THE MESSENGER, CYA)	*1*
GOVERNMENT ACCOUNTABILITY	*1*
SHORT TERM VS. LONG TERM VISION	*1*
MIL STDS 2000 AND 1567	*1*
NUMBER AND COMPLEXITY OF GOVERNMENT AUDITS	*1*
WORKER SKEPTICISM	*1*
DETAILED ACQUISITION REGULATIONS	*1*
EGO	*1*
BUREAUCRACY OR BUREAUCRATIC BEHAVIOR	*1*
SUB-OPTIMIZATION VS. OPTIMIZATION	*1*

TABLE 4-2

TOP 5 BARRIER RANKINGS

Top 5 Barrier Ranking	EXPERT	VF	SF	TOT
[1] Management Willingness to Change	11	12	4	27
[4] DoD Acceptance and Inspection Procedures	8	7	1	16
[12] Congressional Oversight	5	8	2	15
[2] Competition in Contracting Act of 1984	8	3	3	14
[9] Training	6	7	0	13
[5] DoD Specifications	4	6	1	11
[13] Single Year Budgeting	3	3	2	8
[14] Management Mobility	3	3	1	7
[7] Contractor Cost Recovery Systems	3	2	1	6
[8] Ethics	1	2	1	4
[10] Socio-Economic Programs	1	1	1	3
[11] Industry Labor Unions	2	1	0	3
[3] Buy American	0	1	0	1
[15] OMB Circular A-109	0	1	0	1
[6] Industrial Base Concerns	0	0	0	0
Other Barriers	9	15	3	27

TABLE 4-3

a. Table 4-4 Synopsis

- Not included in the Top 2 Barrier Rankings (0 frequency) were *Industrial Base Concerns*, *Buy American*, and *Contractor Cost Recovery Systems*.
- *Training*, *DoD Specifications*, *Socio-Economic Programs*, *Management Mobility*, *OMB Circular A-109*, *Ethics*, *Industrial Base Concerns*, *Buy American*, and *Contractor Cost Recovery Systems* were all excluded from the Top 2 Barrier Ranking by all Experts.
- *Management Willingness to Change* was ranked roughly double in significance than the three closest barriers (*CICA*, *Congressional Oversight*, and *DoD Acceptance and Inspection Procedures*).
- The following barriers appeared in the Top 5 Barrier Ranking (Table 4-3), but did not appear in the Top 2 ranking: *Buy American*
  Contractor Cost Recovery Systems

5. Top 1 Barrier Rankings

Table 4-5 represents the frequency that barriers were indicated by respondents to be the most significant impediments to fully implementing TQM in the DoD Acquisition System. Table 4-5 specifically delineates the category "Other Barriers", in order to fairly present the respondents' Top 1 barriers.

a. Table 4-5 Synopsis

- *Management Willingness to Change* again doubles the respondents assigned significance of the nearest other barriers.
- Each of the *Other Barriers* is a management related statement. Therefore even a greater emphasis on *Management Willingness to Change* could be inferred.
- *CICA* is delineated by respondents as the second most significant impediment. Whereas in the Top 2 Barrier Rankings (Table 4-4), *CICA* and *Congressional Oversight* were perceived nearly equal by respondents.

TOP 2 BARRIER RANKINGS

Top 2 Barrier Ranking	EXPERT	VF	SF	TOT
[1] Management Willingness to Change	6	7	4	17
[2] Competition in Contracting Act of 1984	5	3	0	8
[12] Congressional Oversight	3	4	1	8
[4] DoD Acceptance and Inspection Procedures	3	4	0	7
[13] Single Year Budgeting	2	1	0	3
[9] Training	0	2	0	2
[11] Industry Labor Unions	1	0	0	1
[5] DoD Specifications	0	1	0	1
[10] Socio-Economic Programs	0	1	0	1
[14] Management Mobility	0	1	0	1
[15] OMB Circular A-109	0	1	0	1
[8] Ethics	0	0	1	1
[6] Industrial Base Concerns	0	0	0	0
[3] Buy American	0	0	0	0
[7] Contractor Cost Recovery Systems	0	0	0	0
Other Barriers	5	6	2	13

TABLE 4-4

- The following barriers appeared in the Top 2 Barrier Ranking (Table 4-4), but did not appear in the Top 1 ranking: *Training*
  Industry Labor Unions
  DoD Specifications
  Socio-Economic Programs
  OMB Circular A-109

6. DoD Internal vs. External Control Barriers

Respondents were requested in Section II of the survey to provide their perception of barrier(s), as to whether the barrier was due to one of three categories: *Government Law or Regulation* (GLR), *Internal Policy* (IP), or *Neither* (N). Table 4-6 represents the cumulative frequency that each barrier obtained from the respondents regarding this objective. Table 4-6 is listed in ascending order, starting with barriers with the highest level of perceived GLR, down to IP.

a. Table 4-6 Synopsis

- Table 4-6 indicates that the *Competition in Contracting Act of 1984* is the barrier regarded as the most difficult barrier for DoD to eliminate or effectively neutralize from within.
- *Single Year Budgeting*, *Socio-Economic Programs*, and *Congressional Oversight*, are respectively regarded as barriers that DoD has little internal control over effecting change.
- *Buy American*, *OMB Circular A-109*, *Contractor Cost Recovery Systems*, *DoD Specifications*, and *DoD Acceptance and Inspection Procedures*, reflect barriers regarded as very difficult for DoD to overcome internally, but it is possible.
- *Industrial Base Concerns*, *Ethics*, *Training*, *Management Mobility*, and *Industry Labor Unions* reflect barriers that DoD can exert considerable control over influencing change to reduce the effects of these barriers.
- These three divisions are indicated on Table 4-6 by edition spacing.

TOP 1 BARRIERS

Top 1 Barrier Ranking	EXPERT	Frequency VF	SF	TOT
[1] Management Willingness to Change	4	5	3	12
[2] Competition in Contracting Act of 1984	3	2	0	5
[12] Congressional Oversight	2	1	1	4
[4] DoD Acceptance and Inspection Procedures	1	2	0	3
[13] Single Year Budgeting	1	0	0	1
[14] Management Mobility	1	1	0	2
*Other Barriers	2	5	0	7

***Other Category Top 1 Barriers:**

Expert:	*CONSTANCY OF PURPOSE THROUGHOUT*
Expert:	*LEADERSHIP*
Very Familiar:	*FEAR OF TAKING ON PERSONAL RISK*
Very Familiar:	*LACK OF SINGLE MANAGEMENT FOCUS AT TOP*
Very Familiar:	*EGO*
Very Familiar:	*TOTAL COMMITMENT BY ALL OF MANAGEMENT*
Very Familiar:	*GOVERNMENT ACCOUNTABILITY* (defining the product and holding government managers accountable is difficult)

TABLE 4-5

	Frequency		
Type of Impediment	**GLR**	**IP**	**N**
[2] Competition in Contracting Act of 1984	21	3	0
[13] Single Year Budgeting	21	4	1
[10] Socio-Economic Programs	20	3	1
[12] Congressional Oversight	16	5	5
[3] Buy American	13	2	1
[15] OMB Circular A-109	12	5	0
[7] Contractor Cost Recovery Systems	12	7	1
[5] DoD Specifications	12	12	1
[4] DoD Acceptance and Inspection Procedures	11	16	2
[6] Industrial Base Concerns	8	7	5
[8] Ethics	6	5	8
[9] Training	3	11	10
[1] Management Willingness to Change	3	4	21
[14] Management Mobility	2	12	8
[11] Industry Labor Unions	1	7	12

Note:
GLR = Government Law or Regulation
IP = Internal Policy
N = Neither

TABLE 4-6 This Table represents the respondent's opinion regarding the amount of internal or external control DoD can exert to overcome each barrier. Those barriers at thetop exhibit the least amount of internal control available to DoD. Likewise those barriers towards the bottom exhibit greater internal capacity to decrase the significance of the barrier.

7. Top 1 Barriers - Internal vs. External Control

Table 4-7 is similar to Table 4-6 except that it applies only to the Top 1 barriers as ranked by the respondents (see Top 1 barriers in Table 4-5). Table 4-7 represents the degree of internal control the DoD has over these most significant barriers. The barriers are listed in ascending order, starting with barriers with the highest level of perceived GLR.

a. Table 4-7 Synopsis

- Table 4-7 indicates that *Management Willingness to Change*, is the barrier that DoD has the most internal influence over lessening its impedance.
- The respondents perceive *CICA*, *Single Year Budgeting*, *Socio-Economic Programs*, and *Congressional Oversight* as the barriers that DoD has the least internal ability to change

C. SUMMARY

The questionnaire results were successful in determining the perceived barriers impeding implementation of TQM in the acquisition process. The researcher specifically requested ranking of fifteen potential barriers. Table 4-1 provides the outcome. It is noted that the results of the Top 5 and Top 1 barrier did not fall in the same relative ranking order in each of the Tables. Management Willingness to Change remained at the top of every ranking, making it clearly the most significant barrier indicated by the respondents.

The ranking of the fifteen potential barriers, and to what extent the DoD has ability to internally manage change for those elements, may be crucial in deciding which barriers to attempt to overcome soonest.

TOP 1 BARRIERS - INTERNAL VS. EXTERNAL CONTROL

	FREQUENCY		
Type of Impediment (Top 1 Barriers)	**GLR**	**IP**	**N**
[2] Competition in Contracting Act of 1984	21	3	0
[13] Single Year Budgeting	21	4	1
[12] Congressional Oversight	16	5	5
[4] DoD Acceptance and Inspection Procedures	11	16	2
[14] Management Mobility	2	12	8
[1] Management Willingness to Change	3	4	21

Note:
GLR = Government Law or Regulation
IP = Internal Policy
N = Neither

TABLE 4-7

V. BARRIER ANALYSIS

A. INTRODUCTION

Deming contends that the most important losses to a system are unmeasurable and unknowable. It would be difficult to measure the losses in dollars, worker joy, and customer satisfaction that result from the barriers analyzed in this chapter. Deming challenges management, however, saying that these unmeasurable and unknowable losses are the very ones that we must manage. He states, "It is nonsense to say that if you can't measure it, you can't manage it" [Ref. 11].

The objective of this chapter is to analyze the six barriers presented in Table 4-5 (Top 1 Barriers), in order to gain an understanding of the nature of these barriers, the extent to which DoD can internally make changes to reduce or eliminate the barriers, and appropriate action(s) which could effect overcoming the barriers.

The analysis includes the researcher's subject grouping of the respondent's characterization of each barrier and proposed actions to overcome the barrier. An analysis of the responses by subject element identifies the similarities and differences concerning each barrier.

B. MANAGEMENT WILLINGNESS TO CHANGE

It is evident from the data obtained in this research that *Management Willingness to Change* is perceived as the greatest barrier to implementing TQM in

the DoD acquisition system. Table 4-5 indicates that the degree of significance of this barrier overwhelms the other closest barriers (see also Figure 5-1).

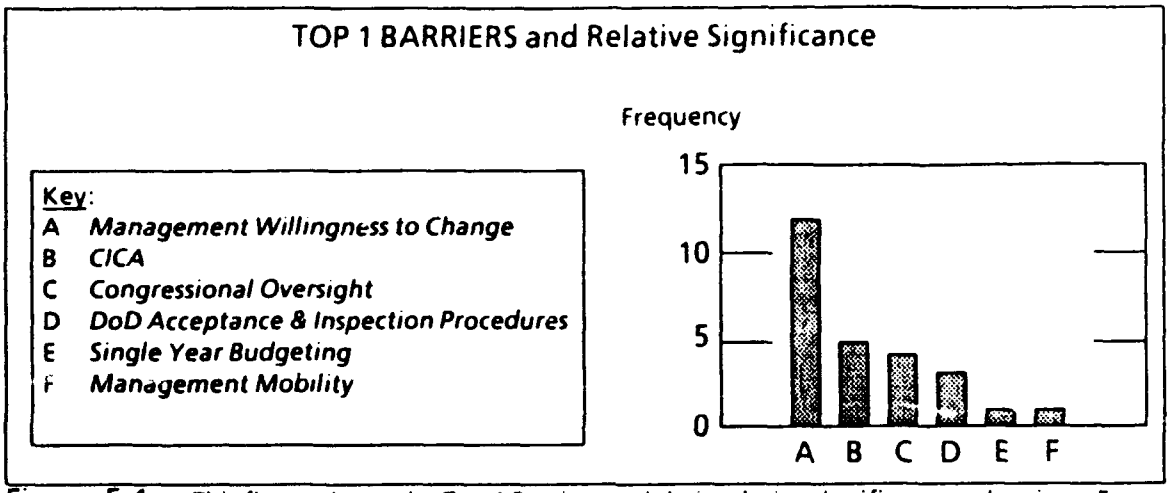


Figure 5-1 This figure shows the Top 1 Barriers and their relative significance as barriers. For instance, the barrier *Management Willingness to Change* is viewed as the most significant, and is more than double the obstacle than the next closest barrier.

The following characteristics of the barrier *Management Willingness to Change* were derived from the comments provided by Expert, Very Familiar, and Somewhat Familiar respondents respectively. The purpose is to summarize the barrier into subcategories to better determine its perceived elements. These categories are not presented in order of precedence. The verbatim comments of Expert respondents regarding *Management Willingness to Change* are contained in Appendix B.

1. Characterization by Expert Respondents

The characteristic elements of this barrier as described by expert respondents, as well as how the barrier might be overcome, are summarized as follows:

a. Commitment

Characterized as an unwillingness by management to make decisions or to place personal reputation subordinate to the long run good of the Government. Management's actions are not linked with rhetoric concerning TQM.

Overcome by: Respondents recommended that directives forcing change be implemented (directives that have "teeth"). Also proposed were, increased training, implementation of organizational management systems that identify the costs of unquality and backing up rhetoric with resources.

b. Management Sees No Need to Change

Managers have been judged successful, rewarded, and promoted under a certain system and see no requirement to change. U.S. managers still believe they are inherently superior.

Overcome by: Respondents stated that education and patience are required to aid management in seeing the need to change. Respondents also indicated that peer and supervisor influence will also be a factor in convincing management of the need for change. Otherwise, only threats to an organization's survival will force management to change.

c. Environment

Employees do not see that the environment has changed because they do not see management living-out TQM.

Overcome by: Employees must see management's conversion and actions that support the numerous written mandates to implement TQM. Management must create a holistic approach to improvement by considering the effects of their actions on the entire system prior to making changes.

d. Communication

There is the perception that the more information one has (as an individual or an organization), the more important one becomes. This tends to inhibit communication rather than encourage it, which is so necessary to effect continuous improvement.

Overcome by Strive to change the culture to one of cooperation vice competition.

e. Leadership

This element is characterized as a lack of constancy of purpose. Also, management's reluctance to commit to TQM is a result of the perception that it is a threat to their operations. Management is unwilling to give up any control.

Overcome by: Leaders must provide a positive environment for value added efforts through cultivation of a holistic and creative approach to improving processes.

2. Characterization by Very Familiar Respondents

a. Leadership

This element indicates that there is a fear of taking personal risks; the current process is understood and change is uncomfortable. Also, cultural changes will not occur if leaders do not follow through on their commitment to

TQM. Another element is that managers are reluctant to ask for help inasmuch as it is a sign of weakness and represents relinquishment of autonomous authority.

Overcome by: Incentives and rewards need to be structured that foster the use of TQM principles in acquisition management. Commitment from the President and Congress (and on down) is required for successful TQM implementation. Managers must be taught to be coaches, and must not demand quick results from TQM efforts.

b. Management Sees No Need to Change

Promotions are based on traditional management approaches; therefore management sees no need to change.

Overcome by: The respondents indicated that training is essential to influencing change in those individuals who were judged successful under the old management style.

c. Commitment

The respondents indicated that management does not believe in TQM, despite many "motherhood" statements. Their actions do not indicate commitment to TQM. This is referred to as paying "lip service" to TQM. Commitment from top management is necessary; however, determining *who is* top management in DoD is difficult.

Overcome by: The respondents suggest making organizational changes to back up motherhood statements about TQM. They also indicated that continuous training must be utilized to overcome this barrier, and if training does not influence willingness to change, then removal from position(s) of authority will

be necessary. Lastly, respondents indicated that consensus between Congress and the DoD regarding resources and regulations would aid in overcoming this barrier.

d. Environment

Top management must act as role models and ensure that all employees understand the importance that TQM has in the fabric of the enterprise. Respondents indicated that managers feel that TQM will cause them to lose control of their "rice bowl(s)".

Overcome by: Management must provide evidence that TQM and process change are essential to improvement; management and labor must become mutually benefiting stakeholders. Also, managers must become team facilitators in solving problems, and possess a thorough understanding of SPC and control charts. Respondents also stated that only management training compatible with TQM should be supported.

e. Lacking Incentives to Change

Those depicting this element said that a business-as-usual attitude is prevalent for both management and labor, and neither trusts each other.

Overcome by: The industry side of the DoD acquisition system should treat labor as a fixed cost in order to build trust between management and labor.

3. Characterization by Somewhat Familiar Respondents

a. Commitment

Respondents claim that top management has a "me-first" or "my boss first", short-term attitude. TQM must be accepted by top level management prior to the expectation that cultural changes will take place. They point out that

commitment and dedication to staying the course is difficult for top management due to pressure from above (short term performance goals).

Overcome by: To overcome the barrier, respondents stated that short-term goals must be traded with long-term goals; reward those who have a long range, vice short range vision. This should be tempered by a realization that those who were successful under the status quo will be extremely resistant to change. Commitment by top management must be visible and unwavering; educate a critical mass of key leaders who will get involved with disciplined process improvement methods.

b. Environment

Respondents stated that the climate necessary to foster TQM, is created by top management. If the proper environment is not created, TQM will become another "ility".

Overcome by: Training personnel, and applying what is learned is proposed as a solution to creating the TQM environment.

c. Understanding TQM

This element indicates that management sees their "managerial rights" challenged by some of the "mysterious" aspects of TQM. Management is afraid to totally commit to TQM. Furthermore, there is also the factor of human nature and the resistance to change that is normally experienced.

Overcome by: Top management must be exposed and trained regarding TQM. Also, a strong visible commitment by the very top management must work its way down through the ranks to the working level.

4. Analysis of the Characteristics

The perception by the respondents that *Management Willingness to Change* is by far the most significant barrier, indicates that the leadership transformation needed for TQM to flourish has not yet been accomplished.

Deming's admonition that a high majority of the problems in any system are problems that only management can solve is particularly apropos' in light of the significance of this barrier as depicted in this study. When management grasps the cultural change, understands, and internalizes the implications of that statement, perhaps *Management Willingness to Change* can be reduced in its significance as a barrier to TQM. The shift to TQM thinking has begun within DoD; however, it will take a significant amount of time for management's current view of the acquisition system to change. Perhaps 10 to 15 years will pass before the transformation has actually occurred [8:p. 149-155]. Maintaining the constancy of purpose necessary to effect the change will be difficult. One author summarizes management's responsibility in this matter by stating that:

> Only top management can establish the constancy of purpose necessary to know and then to meet the customers' needs and expectations. Only they can make policy, establish the set of core values, or set the long-term course for the corporation. Many companies do have policy statements that reflect top management's vision. But it is easy for the folks on the top floor to get religion. Talk is cheap. Top management might be able to set the course, but may never realize that it is also their responsibility to provide a road map so that the rest of the organization may follow [Ref. 17:p. 11].

In expressing management's responsibility with regard to TQM, Expert, Very Familiar (VF), and Somewhat Familiar (SF) respondents *all* indicated that *Management Willingness to Change* has Environment and Commitment as critical elements. All three groups agreed that top management creates the environment

or conditions for TQM implementation. Every group indicated that top management must "live-out" TQM, and act as role models influencing the course that their subordinates will take. Experts said that the environment has not changed so as to create an open climate where the workforce perceives the change and can embrace TQM concepts. The results of top management's failure to create that climate, is a lack of acceptance for TQM concepts by the workforce. One SF respondent pointed out that TQM is in danger of becoming an "ility" , or a buzz word. The researcher's experience in the student environment is that TQM is already a negatively approached buzz word, and it takes top management's (professors in the researcher's case) to create the climate where people can get past the negative connotations that *another new program* faces. Even after exposure, some will remain against it, solely because they view it as another way that management is using to get people to do what management wants them to do.

To overcome the environmental aspect of this barrier, respondents all focused on what should be done by top management to create a TQM environment. Experts, VF, and SF all believe that such an environme t is not established without presentation of evidence of TQM's positive results, and subsequent action to apply TQM. All indicated that management is responsible for providing the proof that TQM can work in the organization. Only Experts indicated that the environment is created as top management holistically lives-out the quality process on a philosophical and practical level. VF and SF solutions were practical in nature, e.g., management and the workforce must agree to be stakeholders with one another, top management must act as facilitators, understand SPC, and only provide management training that is compatible with TQM.

The commitment element of this barrier was characterized by all respondents as: top management does not believe in TQM. They said that top management pays "lip service" to TQM and has not changed from seeking short term personal gains over the long run good of the organization. To overcome the commitment element of *Management Willingness to Change*, the Expert respondents focused on how management can demonstrate commitment, not how to help management become committed. The Experts said that directives of substance, quality measuring systems, and directed resources would improve the perceived level of management's commitment. VF and SF focused on how to make management committed to TQM, e.g., make organizational changes, promote and reward managers based on TQM objectives vice short-term results, and develop a critical mass of top management who are committed and act as examples to their peers.

The element, Management Sees No Need to Change, had Expert and VF respondent comments. They indicate that top management was promoted in the past based on traditional management approaches and apparently see no present link between TQM and future promotions. The respondents point out that in the past, organizations and the managers were viewed as successful. Experts stated that this is a phenomenon whereby U.S. managers still believe that they are inherently better managers. To overcome this element, both Expert and VF respondents recommended concentrating on education of top management with regard to TQM concepts. Experts also stated that peer and supervisor influence is needed to gain the trust of those who do not see the need to change. They said that this should be tempered with patience.

Leadership, was also cited by Expert and VF respondents as one element of *Management Willingness to Change*. Both groups indicated that DoD managers exhibit a high degree of autonomous behavior, i.e., they claimed that DoD managers are independent by nature. The respondents said that managers are groomed to think that a request for assistance is a sign of weakness in a leader. Experts viewed this as a fear by management to take risks by relinquishing some control to the workforce. VF respondents pointed out that lack of leadership induces a lack of constancy of purpose throughout the organization.

Experts attributed to the element of communication, a lack of holistic thinking by managers. Managers view information flow as something that must be controlled inasmuch as *information is power*. They hold back information that might otherwise help the organization, or a peer, in order to use that information as personally benefits them the most. No group commented on the communication between management and the workforce that is an integral part of TQM. The focus was on the independent nature of DoD managers. To overcome this barrier, Expert respondents indicated that a culture of cooperation, not competition must be fostered by top management.

The group, SF, pointed out that many managers view some aspects of TQM as "mysterious". In order to overcome this element it is necessary that top management fully understand the essential elements of TQM, otherwise significant levels of commitment will not be achieved. This perception, that TQM holds some mysterious truths is critical to overcome. Deming explains that it as appreciation for a system, theory of variation, theory of knowledge, and psychology.

5. Summary of the Barrier, Management Willingness to Change

The respondents brought forth many elements to the characterization of this barrier. Among the headlines were the following: Management's unwillingness to commit to transformation creates a lack of constancy of purpose for the organization. Transformation, or commitment to the new culture is viewed as risky by some top managers who are skeptical of new programs or view TQM as a threat to traditional management approaches. Employees do not see that the environment has changed primarily because they do not see management living-out the TQM philosophy. The competitive environment still prevails over the cooperative environment. The prevailing environment is the one in which managers have been judged successful and promoted, and now see no requirement to change, especially when control mechanisms have not changed to incentivize changes in management behavior. Other control measures such as measuring systems to determine the costs of poor quality are lacking. Part of the reason that TQM is resisted is because U.S. managers still believe they are inherently superior to managers from other cultures. U.S. managers think that control systems are set in place to give guidance to lower level management so lower management can run the show. TQM says that top management must become stakeholders together with the workforce. This superiority mentality, along with management's unwillingness to place personal reputation subordinate to the long run good of the organization is detrimental to the TQM environment.

Following analysis of the respondents' comments, the elements below are presented as a guidelines for leading a TQM effort (assumes that the leader has a base of profound knowledge):

- Understand the "mysterious" aspects of TQM and be able to explain them (profound knowledge).
- Provide a positive environment for value added efforts.
- Cultivate a culture of cooperation vice competition.
- Live out TQM by personal example.
- Foster holistic and creative approaches to improving processes.
- Provide examples and evidence that TQM is working.
- Become a stakeholder with the workforce for the success of the organization.
- Facilitate TQM. Become a coach.
- Apply TQM principles (apply head knowledge).
- Lose your "business as usual" approach to improvement.
- Publish long run organizational goals that commit resources (link TQM to the organization's business plan).
- Measure improvement.
- Make your commitment to TQM visible to the workforce.
- Develop a critical mass of TQM proponents.
- Incentivize people to apply TQM.
- Link promotions and rewards to TQM vice short term goals.
- Make organizational changes when there are barriers to TQM.
- Ensure all directives clearly come under the TQM umbrella.
- Build internal and external political consensus for TQM approaches.
- Build trust with the workforce by commitment to provide jobs.
- Be patient.
- Influence peers and superiors alike.

C. COMPETITION IN CONTRACTING ACT OF 1984

The *Competition in Contracting Act of 1984* is ranked as the number two most significant barrier blocking implementation of TQM in the DoD acquisition system. With regard to the level of difficulty the DoD would possibly face trying to internally reduce this barrier, the respondents perceived the barrier as *the* most difficult (see Figure 5-2) to effect change internally.

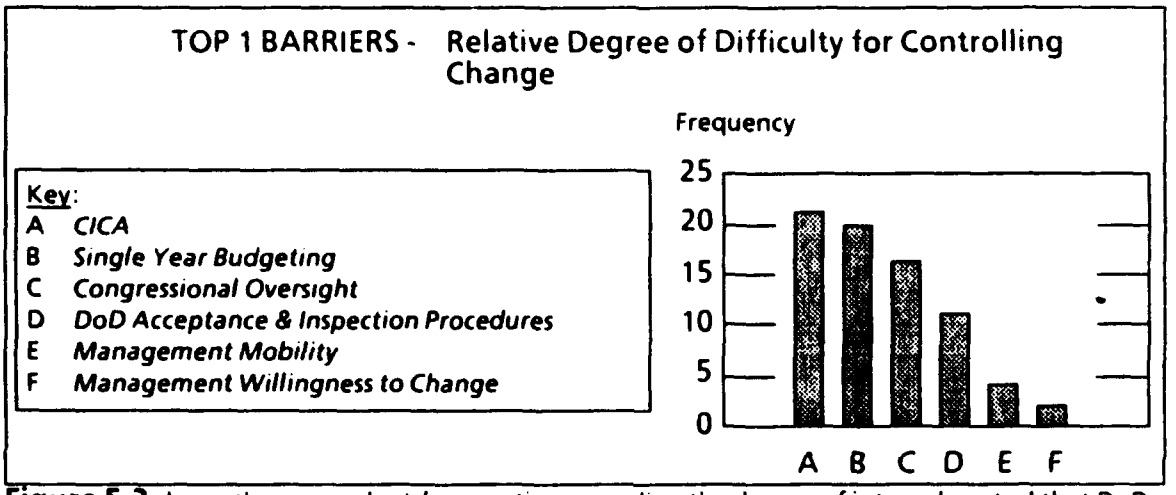


Figure 5-2 shows the respondents' perception regarding the degree of internal control that DoD has over the barrier. For instance, to overcome *CICA*, perhaps statute would have to be modified. Whereas to overcome *Management Willingness to Change*, relatively fewer statutes or regulations act as obstacles in overcoming the barrier.

The following barrier characterizations are derived from the comments provided by Expert, Very Familiar, and Somewhat Familiar respondents respectively. The purpose is to summarize this barrier into subcategories to better determine its perceived elements. These categories are not intended to be presented in any order of precedence. The verbatim comments of Expert

respondents regarding the *Competition in Contracting Act of 1984* are contained in Appendix C.

1. Characterization by Expert Respondents

a. Multiple Sources Duplicates Resource Spending

One respondent claimed that competition within the same industry leads to the waste of scarce resources due to duplicated research (without coordination between companies). This respondent also stated that bidding, and price cutting guarantees lesser quality products will be received.

Overcome by: The respondent recommended revising antitrust laws to allow greater cooperation within industries.

b. Perpetuates Poor Quality Sources

Development of long term relationships with quality suppliers is hindered by *CICA*. The requirement for multiple sources fosters carrying poor quality suppliers in the DoD acquisition system.

Overcome by: Amend *CICA* to allow for purchase of quality over price. Stop internal policies that make *CICA* more restrictive than the law requires.

c. Low Bidder Mentality

Respondents indicated that the requirement to award to the low bidder destroys attempts to foster long term relationships with suppliers. Furthermore, the respondents said that adversarial relationships are the result of the low bidder mentality.

Overcome by: The respondent claims that education is a partial means by which the barrier might be overcome. *CICA* should be amended to allow

for long term relationships with suppliers. Also, awarding contracts based on the long run price, as well as quality, will assist in overcoming the barrier.

d. Inflexible

With *CICA* in place, there is little that can be done to foster TQM-like buyer and supplier relationships. Attempts to improve quality of suppliers, and comply with *CICA*, have not provided positive results.

Overcome by: Amend *CICA* to allow better quality suppliers long term relationships with the Government.

2. Characterization by Very Familiar Respondents

a. Emphasis on Price

CICA does not encourage quality to become part of the acquisition equation. There is no opportunity to rate and select quality over competitive price. The idea that the Government is only trying to meet its minimum needs places a low emphasis on the quality of supplies or services received.

Overcome by: The source selection process should rate quality. Apply greater emphasis on prevention of poor quality as opposed to lowest cost.

b. Does Not Allow Long Term Buyer-Supplier Relationships

This respondent refers to DoD's inability to implement Deming's point number four, which encourages a limited supplier base of quality suppliers with whom long term relationships are maintained in order to minimize costs.

Overcome by: The respondent recommends repeal of *CICA* and the elimination of competition advocate positions. Obtaining good contractors would still involve competition, but a long term relationship would be possible.

3. Characterization by Somewhat Familiar Respondents

There were no comments by Somewhat Familiar respondents concerning the barrier, *CICA*. This is reflected in Table 4-5, Top 1 Barrier Rankings.

4. Analysis of the Characteristics

Deming claims that we are in a new economic age. What does that mean? He claims that we have "been sold down the river" by the economic theory of salvation by competition in the market place. Sold down the river? Did not competitive style capitalism influence the end of the Cold War?

In his seminar, Deming discussed the failing of communism. He claimed that communism did not fail due to the lack of the attributes that capitalism has, but rather they did not understand the concept of customer driven quality. "They have no idea (concept) of a customer. They take what they get. Five, six, seven years to obtain an automobile. A market driven economy serves the customer. They never had it." [Ref. 11]

The new economic age that Deming speaks of is one of cooperation, not competition. Deming states that discounts on prices force other companies to lower their prices. "Sounds good", he says, but in fact, oscillation in prices and varying sources (awarding one time to one supplier, and another time to a different supplier), takes you further and further from your desires as a customer [Ref. 11] and [Ref 8:p. 327-334]. Expert respondents in this thesis research indicate that DoD's competitive bidding system is not one of cooperation, in fact, they contend that the system guarantees low quality deliveries, and causes adversarial relationships with suppliers.

Findings of the 1989 U.S. Department of Defense Technology Assessment Team on Japanese Manufacturing Technology also confirm that cooperation is not the norm in the DoD acquisition system:

> The Japanese experience contrasts with that found in the United States, particularly with major DoD manufacturers, where prime contractors communicate with detailed specifications, seek the lowest available price, often to the exclusion of other factors, and encourage intense, even cutthroat competition among vendors for short-term contracts. That results in an unstable vendor community in which the benefits of a long-term relationship do not accrue and where the expertise of the vendor has little opportunity to affect product design or production. [Ref. 3:p. 62]

Both Expert and VF respondents pointed out that *CICA* fosters competitive short term buyer-supplier relationships. Ford Motor Company had a similar problem, so they initiated an effort to bring about the benefits that could be derived from long-term contract relationships, i.e., minimize costs to the system. Mr. L. M. Chicoine, Vice President for Purchasing, was evaluating the progress Ford had made in establishing this new long-term (greater than one year) policy, and found that there had been no appreciable increase in longer term contracts six months after implementation of the initiative. Ford found that the one barrier blocking increase to the number of long-term contracts was a requirement that purchasing officials obtain approval (through two levels of supervision) for contracts written for greater than one year. To break down that barrier, a one word change in policy reversed the trend. Ford made it necessary for purchasing officials to obtain approval to write contracts for *less than* one year. No improvement was achieved until management changed the system. [Ref. 17:p. 131-2]

This fundamental change to Ford's purchasing system fostered long term relationships with suppliers. It is interesting to note that one Expert respondent characterized *CICA* as being inflexible (like Ford's original purchasing system). This respondent had experience in trying to improve the quality of suppliers, but there was little that could be done because of *CICA*. Likewise, the highly regarded expert, Dr. Yoshida, stated to the researcher that the "...number one priority (for DoD) should be establishing long term relationships with suppliers" [Ref. 18]. Another TQM expert observes:

> Unsuccessful total quality management will fail to distinguish between suppliers. The unsuccessful will not develop relationships with critical suppliers, will not develop incentives for improved supplier quality, will not differentiate in the inspections and controls required with different suppliers, and--admittedly hampered by government regulations--will provide the same profits to their best and worst suppliers. [Ref. 19:p.67]

In order to overcome the short-term buyer-supplier relationship element of *CICA*, both Expert and VF respondents stated that the law should be amended to allow for longer-term relationships. Surprisingly, no respondent indicated that greater use of multiyear contracting would better foster long term relationships. The 1991 National Defense Authorization Act has taken some measures to reduce some of the requirement for use of multiyear contracts. [Ref: 20:p. 35]

Regarding the emphasis that *CICA* places on price, a 1989 Joint OSD-Air Force-Industry study on TQM impediments confirmed that it is the Government's practice to require all individual procurement actions to be awarded on the basis of full and open competition (with few exceptions). The report went on to say that *CICA* proliferates bidding for Government contracts, thereby adding significant "non-value-added" costs (unquantifiable costs) to the acquisition

system. The Expert and VF respondents also conveyed that the low bidder mentality to obtain the Government's "minimum" needs, does not minimize costs in the long run. They point out that "minimum" needs is DoD's current buying culture. The quality culture has not yet penetrated DoD's buying practices.

Some of the non-value costs added by *CICA* involve the award protest system. Protests were not specifically mentioned by any respondent group as being an element of the nature of this barrier; however, Expert respondents do portray *CICA* as being cause for adversarial relationships between the Government and defense contractors.

Along the same lines, the OSD-Air Force-Industry study claims that increased use of TQM selection criteria will result in an increase in protests, and that the protest system may be a subset barrier of *CICA* [Ref. 2:p. 17]. Therefore, amending *CICA* to allow for quality measures in source selection criteria will not eliminate the protest problem, and in fact may add even greater non-value added costs to the buying process. This would be tantamount to Ford's first attempt at solving the quality supplier problem. The Expert and VF respondents also characterize the *CICA* barrier as perpetuating poor quality suppliers; that source selection should factor in quality, but cannot under *CICA*. One acquisition expert commented of *CICA*:

> ...there is no place where seeking competition is coupled with objectives of cost savings, innovation, schedule benefits, or economy and efficiency. One must, therefore be concerned that the statute will encourage competition for competition's sake, regardless of other effects. [21:p. 134]

Expert respondents also indicated that in order to overcome *CICA* as a barrier to TQM, the Competition Advocates in the Services should be

disestablished. The Joint OSD-Air Force-Industry study likewise portends that DoD's use of Competition Advocates to increase the supplier base and promote competition, often runs counter to TQM objectives [Ref. 2:p. 17]. The OSD-Air Force-Industry study (like the respondents in this research) recommended amendment of *CICA* to make the law consistent with TQM principles.

It is perhaps relevant to comment on the DoD's industrial base at this point because often the rationale for competition is based on the belief that DoD's industrial base will be generally healthier by having more suppliers. None of the respondents linked industrial base concerns with *CICA*; however, the characterization of *CICA* as being inflexible was one of *CICA's* elements as previously mentioned. The findings of the DoD Technology Assessment Team on Japanese Manufacturing Technology point out that while Japanese firms have fewer suppliers (long-term relationships), their system of subcontracting allows prime contractors greater flexibility to respond to changing market and changing demands [Ref. 3:p. xx]. In the DoD acquisition system, prime contractors deal directly with many suppliers, whereas Japanese prime contractors (albeit the reference is to private industry), deal directly with only a few primary subcontractors. Likewise, Japanese primary subcontractors then deal directly with a few secondary subcontractors in a relationship based on a long-term commitment, high performance, and quality in addition to price [Ref. 3:p. xx]. This point is brought forth by the researcher to point out that the argument that competition is beneficial to the industrial base, may not be self-evident. This is reflected in the low ranking the respondents attributed to the barrier *Industrial Base Concerns* (see Table 4-1).

Finally, one Expert respondent remarked concerning the duplicative expenditure of resources that occurs due to the competitive versus cooperative nature of the DoD acquisition system as it pertains to research. This respondent, like Deming, criticizes U.S. antitrust laws which preclude companies in the same industry from cooperating with one another regarding research [Ref. 8:p. 152].

5. Summary of the Barrier, Competition In Contracting Act of 1984

Experts ranked *CICA* as a more significant barrier than any other respondent group. Both the Expert and Very Familiar respondents indicated that the law should be modified or repealed in order to foster longer term relationships with contractors and higher quality, process oriented products. One Expert respondent went beyond the scope of *CICA* and recommended that Antitrust laws be amended to allow for greater cooperation in the research stages of product development. Both Expert and Very Familiar respondents indicated that *CICA* does not target the quality of items received, but rather strictly focuses on price competition.

Following analysis, these elements were adopted from Expert, VF, and SF respondents and are synopsized below as potential solutions to overcoming the barrier, CICA:

- Amend CICA to allow for purchase of quality (make quality a part of source selection criteria), and long term relationships with suppliers.
- Award on total minimum cost to the system.
- Stop internal policies that make CICA more restrictive than necessary.
- Have competition, but make the buyer-supplier relationship longer term.
- Disestablish competition advocate positions within the services.

- Amend antitrust laws.

D. CONGRESSIONAL OVERSIGHT

Congressional Oversight, viewed by respondents as the third most significant Top 1 Barrier (Table 4-5), is also perceived by respondents to be relatively difficult to overcome internally (Figure 5-2 refers).

The following barrier characterizations are derived from the comments provided by Expert, Very Familiar, and Somewhat Familiar respondents respectively. The purpose is to summarize the barrier into subcategories to better determine its perceived elements. These characterizations are not presented in order of precedence. The Verbatim comments of Expert respondents regarding *Congressional Oversight* are contained in Appendix D.

1. Characterization by Expert Respondents

a. DoD Track Record Fosters Congressional Micromanagement

Congress is partially justified in its oversight of the DoD acquisition system due to cost-overruns and Ill Wind type incidents. Furthermore, it is unlikely that *Congressional Oversight* will decrease.

Overcome by: DoD and contractors must be more open to disclosing unfavorable information to Congress. Both DoD and defense contractors must perform better in applied business judgment, and ethically, in order to increase the trust of Congress.

b. Political Incentives Conflict with TQM

A politician's incentive for vote seeking is greater than a politician's incentive to look at the holistic improvement of the system.

Overcome by: Educate Congress and the public regarding the need to reject current acquisition system buying practices which foster short term relationships with poor quality suppliers.

c. Congressional Action Greatly Influences the Acquisition System

Major changes cannot be made to the acquisition process without the support of key people in Congress (staff and Congressional members).

Overcome by: This can be accomplished by obtaining the backing of key Congressional members to assist in structuring the acquisition system to be in line with TQM concepts. DoD must aid in increasing Congress' understanding of total quality approaches.

2. Characterization by Very Familiar Respondents

a. DoD Acquisition System is Often Politicized by Congress

Congress must recognize that it does not make good business sense to use the defense acquisition system to promote political social agendas.

Overcome by: Educate Congress that political and social agendas often produce poor business decisions.

b. Political Incentives Conflict with TQM

The vote seeking nature of politicians is incompatible with TQM; too many decisions regarding the defense acquisition system are made based on politics vice sound business judgment.

Overcome: Respondents stated that there is no way to overcome this barrier, therefore TQM will be very difficult to apply within the Government.

c. Excessive Oversight Discourages Decision Making

Excessive oversight creates a "bunker" mentality within DoD; "everyone pulls their steel pot down over their toes". This mentality creates the barrier *Management Willingness to Change*, and discourages creative decision making due to management's fear of punishment.

Overcome by: No comments were provided.

3. Characterization by Somewhat Familiar Respondents

a. Detailed Statutes Complicate and Slow the Acquisition Process

Detailed procurement statutes are statements of mistrust by Congress (mistrust of DoD acquisition officials).

Overcome by: DoD should ensure that Congress and congressional staff members fully understand the implications of proposed procurement statue(s). Congress must view changes with a TQM prospective.

b. Congressional Action Greatly Influences the Acquisition System

Congress has evolved the acquisition system through statutes and regulations, and it is Congress that must be on board with TQM philosophies in order to make fundamental changes to restructure the system. Until Congress adopts a TQM attitude, much action at lower levels will be wasted.

Overcome by: DoD should isolate influential congressional leaders and visibly demonstrate how TQM reduces costs. Also, DoD should develop clear TQM objectives, articulate those objectives, and challenge Congress to embrace the concept, philosophy, and reality of TQM.

4. Analysis of the Characteristics

Deming is adamant that the top management in an organization must be committed to the new quality philosophy, or the philosophy will fail. This raises the question: *who* is top management for the DoD acquisition system? Is top management for DoD the Secretary of Defense? Is it the President? Is it Congress? Obviously, top management is politically shared and is therefore fundamentally different from private sector business enterprises. All groups of respondents in this research indicated that the Congress is at least near the top, and is probably the de facto candidate for the "top management" billing for the DoD acquisition system due to Congress' control over the budget and their influence over acquisition statutes and regulations.

The public and the Congress clearly expect the DoD acquisition system to operate in a rational, business-wise manner; optimizing the acquisition role within DoD. But in actuality, the *system* influencing DoD acquisition managers' *decisions, is often one of a political consensus nature, not rationality.* Expert and VF respondents viewed TQM as being a rational process, however, they pointed out, the environment that the acquisition system is closely linked to revolves around a politically motivated process. They stated that vote gathering is the politican's life blood, and that a politican's decisions will normally favor his constituency. In turn, a decision framed in a political context, may directly conflict with what is best for the system as a whole. One Expert responded that there is no way to overcome this barrier. Another SF respondent said that education of politicians and voters regarding new quality principles would help alleviate this element thus better aligning TQM and political thinking with one another.

Expert and SF groups highlighted the element, Congressional action greatly influences the acquisition system as characterization of *Congressional Oversight*. Congress by law, has helped create the DoD acquisition system. The legislative branch exerts more influence over the DoD acquisition system by their oversight (with GAO), the budget, and statutory development. These respondents pointed out that without support from key members of Congress, much of lower management's efforts to implement TQM will be wasted. In order to obtain TQM backing, the respondents convey the need for DoD to isolate key political stakeholders in Congress and solicit their support for TQM efforts.

With regard to the *Congressional Oversight*, and specifically the micromanagement aspect, all three respondent groups characterized the element differently. Experts admitted that DoD has brought much of the micromanagement upon itself. VF said that it discourages decision making, and SF said that the detailed laws and regulations prove Congress' distrust of acquisition managers.

Perhaps agreement over is who top management is not the overriding question. The important question is: "In the DoD acquisition system environment of shared management, are the law, regulation, and policy makers operating under an umbrella of profound understanding regarding TQM principles?" The solutions posed by the respondents indicate that DoD must recognize the shared power nature of the DoD acquisition system and seek to influence political thinking where possible to encompass TQM concepts. If, as Deming says, a large majority of the problems a system faces are management problems--not the workforces', then clearly Congress must be a partner in implementing TQM within the DoD.

5. Summary of the Barrier, Congressional Oversight

The respondents explain that DoD's past inabilities to manage the acquisition system effectively bring on *Congressional Oversight*, and that the very nature of the Congress as keepers of the purse, gives them fiduciary responsibility to the taxpayers to oversee the acquisition system. Acquisition managers have responsibility to the taxpayers as well, but *Congressional Oversight* in the form of detailed acquisition regulation have placed complicated and conflicting requirements upon the system. All three groups acknowledge Congress' significant influence over the acquisition system, with Experts and Very Familiar respondents referring to Congress' inherent vote seeking nature as oft times contrary to good business judgment and TQM principles. All three groups see support from Congress regarding TQM concepts as a requirement for DoD to receive the full benefit that TQM has to offer.

Following analysis, these elements were adopted from the comments of Expert, VF, an SF respondents as potential solutions to the barrier, *Congressional Oversight*:

- No way to overcome Congressional Oversight. Work with Congress for continuous improvement.
- DoD should be more forthright with Congress concerning "bad news".
- DoD and defense contractors must perform more ethically (Build Congress' trust).
- Educate Congress and the public regarding the faulty nature of some DoD buying practices. Congress should view changes to the acquisition system under the TQM umbrella.

E. DOD ACCEPTANCE AND INSPECTION PROCEDURES

Ranked fourth in significance in the Top 1 Barriers (Table 4-5), this barrier is viewed by respondents as being relatively difficult to overcome internally, but not as difficult as *CICA*, *Single Year Budgeting*, and *Congressional Oversight.*

The following barrier categories are derived from the comments provided by Expert, Very Familiar, and Somewhat Familiar respondents respectively. The purpose is to summarize the barrier into subcategories to better determine its perceived elements. These categories are not presented in any order of precedence. The verbatim comments of expert respondents regarding *DoD Acceptance and Inspection Procedures* are contained in Appendix E.

1. Characterization by Expert Respondents

a. Reliance on Tailgate Inspection Systems

The current methods of inspecting do not foster improvement of processes and do not provide quality products.

Overcome by: The DoD needs to use acceptance and inspection systems that place emphasis on process control and contractor self-inspection.

b. System does not Allow Contractors to Manage Their Own Processes

More significant improvements to quality would be achieved if the acceptance and inspection system were modified to allow contractors to manage processes, vice managing outcome(s) only.

Overcome by: The DoD should move rapidly to adopt In-Plant Quality Evaluation (IQUE) concepts. (The IQUE program will be described in the analysis section of this barrier .)

c. System does not Foster Reductions in Costs

Not allowing contractors to manage processes fosters continuation of a system of acceptance and inspection that adds costs to products rather than reducing costs.

Overcome by: The DoD should move rapidly to adopt In-Plant Quality Evaluation (IQUE) concepts.

d. Fosters Adversarial Relationships

The current system of Government acceptance and inspection does not allow the buyer and supplier to establish a relationship based on trust.

Overcome by: The DoD should move rapidly to adopt In-Plant Quality Evaluation (IQUE) concepts.

e. Guarantees Production and Sale of Defects to the Government

DoD's acceptance and inspection system gives defense contractors profit for scrap and rework, thereby taking away their initiative to improve quality.

Overcome by: The Government must improve operational definitions associated with specifications, use statistical process control (SPC) and Cpk's as substitution and augmentation of existing inspection requirements. The Government should eliminate the use of AQLs and stop paying contractors profit on scrap and rework.

2. Characterization by Very Familiar Respondents

a. Reliance on Tailgate Inspection Systems

A respondent stated that the current system of acceptance and inspection *tries* to ensure that quality material is received; however, many of the existing inspection systems are elaborate and expensive. Also, the presence of in-plant Government inspectors is a source of irritation for the supplier.

Overcome by: The Government should decrease oversight of contractors by in-plant inspectors and replace the tailgate inspection mentality with process oriented standards.

b. Refusal by Government Inspectors to Recognize Changes to Processes and Specifications that Improve Quality

This view reflects the inflexibility of the Government's system involving in-plant quality inspectors. The current system restricts contractors from improving processes in order to reduce costs while supplying better quality products.

Overcome by: Upper management must exert constant pressure to allow contractors needed flexibility. Adequate training and Government-Contractor teaming are absolutely essential. Government customers must be willing to accept process change.

3. Characterization by Somewhat Familiar Respondents

There were no comments by Somewhat Familiar respondents concerning the barrier, *DoD Acceptance and Inspection Procedures*. This is reflected in Table 4-5, Top 1 Barrier Rankings.

4. Analysis of the Characteristics

The most widely applied procedures for acceptance and inspection used by DoD to inspect the product of suppliers is based on statistical sampling and end process inspection [Ref. 2:p. 12-13]. Developed at around the same time as statistical process control (SPC) in the 1920's, statistical sampling inspection was perfected during WW II within the defense industry, and remains the primary means of inspecting and accepting today. This sampling method provides very late feedback to the supplier regarding the control of manufacturing systems. Inspection is performed at the end of the production cycle, vice testing conformance during production [Ref. 23:p. 218-219].

There are several important lessons to learn from the comments provided by the respondents in this study and the literature regarding inspection and acceptance and how DoD typically performs these functions. First, the opportunity to improve the quality of products is the greatest during the early stages of design and production. Attempting to add or improve quality to existing processes, vice fundamentally changing processes from the outset, will fail to make the improvements that TQM has to offer [Ref. 22:p.65][Ref. 23:p. 146]. Both Expert and Very Familiar respondents referred to this as "tailgate inspection". These respondents indicated that although the current system seeks to foster the acceptance of quality products, it falls short in doing so. In fact, one expert respondent stated that the current system guarantees the acceptance of defects. This leads to another detrimental aspect of this barrier.

End-process inspection is very costly. One respondent said that the tailgate inspection mentality leads to higher costs. Both Taguchi and Deming

point out that large, end-of-the-line, quality assurance and inspection groups do nothing to increase quality, in fact they guarantee that defective product(s) will be accepted [Ref. 5:p. 133]. Inspection at the end results in shipping defective product(s), rework, or scrap. One expert respondent explained that his company was planning a building expansion program at one plant cite. It turned out that the expansion was needed to house all the rejected products awaiting rework! Rework raises costs significantly. Besides labor, materials, and perhaps redesign costs, this company was considering investing in poor quality products.

Deming's Point 3, *Cease Dependence on Mass Inspection*, claims that evaluating quality at the end is too late. Warranties (not mentioned by any respondents) are required by law to be in DoD contracts pertaining to major program contracts, and are indirectly paid for by the Government. Warranties are an attempt to ensure that the Government is protecting itself from defects that are inevitable under the current inspection system. Deming relates the story of a beer manufacturer who said he had no problem with the quality of the cans he received from his supplier. Any can that was found to be defective was replaced *free* by the supplier (a good warrantee). "It had not occurred to him that his customers are footing the bill" [Ref. 8: 28].

Emphasis was placed by all respondents on supplier self-inspection and improvement of processes, rather than end of the line rework. Taguchi's statistical methods for inspection (espoused by Deming) do not attack the "problem of *mean* results, but instead concentrate on reducing variance around the average." [Ref. 23:p. 143] This is the intent of the In-Plant Quality Evaluation (IQUE) program referred to by respondents as a means by which to overcome this barrier. The

Defense Logistics Agency's (DLA), Defense Contract Management Command (DCMC) has targeted 19,000 contractor facilities for implementation of this program by June 1991 [Ref. 24:p. 1]. This very aggressive program focuses on teamwork between the Government and contractor, as well as analysis of processes vice end item inspection. One Expert respondent cited the adversarial relationship that pervades the current system. That Expert also suggested that the IQUE program would reduce this adversarial characteristic from the Government-Industry relationship. This is encouraging in light of remarks provided by both Expert and Very Familiar respondents indicating that there is too much in-plant oversight of contractor performance. Additionally, Government inspectors are inflexible in allowing the contractor to make improvements to processes, especially when a procedure or specification definitively calls for that process to be performed a certain way.

5. Summary of the Barrier, DoD Acceptance and Inspection Procedures

Both Expert and Very Familiar respondents refer to the current system as "tailgate" in nature. Both also recognize the adversarial relationship which operates under the tailgate system; especially when contractors may be trying to improve processes, but Government oversight will not allow improvement without extensive justification. Experts also speak to the additional costs that end process inspection places on the buyer and supplier, but that the Government perpetuates these costs by paying contractors profit for scrap and rework. All respondents suggested overcoming the barrier involves empowering contractor's with self-inspection and improvement of processes.

Following analysis, these elements were adopted from the comments of Expert, VF, an SF respondents as potential solutions to the barrier, *DoD Acceptance and Inspection Procedures*:

- Emphasize contractor in-process inspection systems vice tailgate inspection.
- Adopt IQUE concepts.
- Specifications should provide clear, operational definitions of the work to be performed.
- Use SPC and cost analysis to determine when inspection is necessary; eliminate AQLs.
- Do not pay contractors profit for scrap and rework.
- Government and contractor teaming should be the norm--not adversarial relationships.

F. SINGLE YEAR BUDGETING

This barrier was ranked fifth in the Top 1 Barriers listed in Table 4-5. It was viewed by respondents as being second in degree of difficulty for *DoD internal* change (see Figure 5-2).

The following characterizations of this barrier are derived from the comments provided by Expert, Very Familiar, and Somewhat Familiar respondents, respectively. The purpose is to summarize the barrier into subcategories to better determine its perceived elements. These categories are not intended to be presented in any order of precedence. The verbatim comments of expert respondents regarding *Single Year Budgeting* are contained in Appendix F.

1. Characterization by Expert Respondents

a. Does not Cultivate Long Term Process Improvements

The respondents stated that organizations have more difficulty planning, investing, and implementing longer term strategies because of *Single Year* budgeting. This barrier fosters processes that produce minimum quality products.

Overcome by: No comments were provided by the respondents for this element.

b. Contractors and Subcontractors Have a One Contract Horizon

The respondents indicated that longer term contracts receive more investment and process improvement effort.

Overcome by: The DoD should initiate and assist in the educating politicians and the general public regarding the effects of adverse buying practices that do not place enough emphasis on the quality of products.

2. Characterization by Very Familiar Respondents

a. Drives the Acquisition System to Short Term Thinking and Planning

One respondent indicated that without some degree of certainty for follow-on business, it is difficult to justify investing in people and facilities.

Overcome by: No comments were provided by the respondents for this element.

3. Characterization by Somewhat Familiar Respondents

There were no comments by Somewhat Familiar respondents concerning the barrier, *Single Year Budgeting*. This is reflected in Table 4-5, Top 1 Barrier Ranking.

4. Analysis of the Characteristics

Despite a Six Year Defense Plan (SYDP) that annually seeks to outline the DoD's budget through the Planning, Programming, Budgeting System (PPBS) and Congress' attempts at two year authorization legislation, the perception is relatively high that the budget process outcome, a *single year budget*, is a major barrier to implementing TQM principles in the DoD acquisition system. Two aspects of this barrier were brought out in the respondent's comments. First, both Expert and Very Familiar respondents linked the quality of the delivered products to *Single Year Budgeting*. According to the respondents, uncertainty regarding future business forces contractors to hold back on process improvements. Therefore, the short term relationship that is fostered by *Single Year Budgeting* drives contractors to the utilization of processes that do not focus on continuous improvement.

Secondly, all respondents (both Expert and Very Familiar) linked this barrier to lack of investment by defense contractors. DoD has performed many profit studies to determine why DoD contractors exhibit lower investment rates than private sector contractors. Usually these studies have resulted in adjustment of profit allowances structured by Government Contracting Officers in applying the Weighted Guidelines. The respondents in this study did not link investment to

profit as past profit studies have. They linked investment to long term buyer-supplier relationships.

The respondents did not propose many ways that this barrier might be overcome. The only comment provided focused on educating Congress and the public regarding the faulty nature of *Single Year Budgeting*. This barrier overlaps with *CICA*, due to the influence that Congressional actions and existing statutes have on generally pervasive short term buyer-supplier relationships. The comments of respondents indicate that the signal that *Single Year Budgeting* sends to defense acquisition managers and contractors is one of uncertainty about the future. Therefore there will quite naturally be a pervasive lack of long term strategic planning and investment. Short horizons influence management thinking both by DoD acquisition personnel and defense contractors. The decisions these managers make are a direct product of the system that they work within.

5. Summary of Barrier, Single Year Budgeting

The respondents portray this barrier as having detrimental effects on investment levels that could focus on process improvement. They indicated that this barrier contributes to short-term business decisions that produce short-term payoffs to the detriment of long term planning, facilities investment, and training. The short term nature of the relationships between DoD and suppliers is at least partially attributable to *Single Year Budgeting*.

Following analysis, these elements were adopted from the comments of Expert, VF, an SF respondents as potential solutions to the barrier, *Single Year Budgeting*:

- Begin with education of politicians and the public regarding the benefits of long-term buyer-supplier relationships.
- Significant investment will not occur without contractors having commitment of future business.

G. MANAGEMENT MOBILITY

Management Mobility is the sixth ranked barrier in the Top 1 Barriers list (Table 4-5). This barrier is perceived by respondents to be relatively less difficult for the DoD to manage, internally, without significant changes to statue or regulation.

The following barrier characterizations are derived from the comments provided by Expert, Very Familiar, and Somewhat Familiar respondents respectively. The purpose is to summarize the barrier into subcategories to better determine its perceived elements. These categories are not intended to be presented in any order of precedence. The verbatim comments of Expert respondents regarding *Management Mobility* are contained in Appendix G.

1. Characterization by Expert Respondents

a. Leads to Short Term Decision Making

The respondents stated that transient terms of office influence short term decisions and results. That is to say, that in order to impress superiors, transient managers act in their own best interests rather than the organizations.

Overcome by: No comments were provided by the respondents for this element.

2. Characterization by Very Familiar Respondents

a. Constancy of Purpose Not Maintained

One respondent commented that *Management Mobility* is one factor in creating a "survival" mentality by senior leadership, and that because of this, organizations frequently face a lack of long range vision.

Overcome by: DoD and defense contractors should ensure that new leaders and managers receive TQM training prior to taking top management positions.

b. Discourages Forward Thinking

The respondents stated that because a manager's predecessor is perceived as having been successful, there is little incentive to introduce new and creative strategies for an organization.

Overcome by: No comments were provided by the respondents for this element.

c. Encourages Managing the Process Vice Exercising Leadership

Some respondents were concerned with top management's tendency to direct organizations through inspections and budgets rather than exercising leadership.

Overcome by: No comments were provided by the respondents for this element.

3. Characterization by Somewhat Familiar Respondents

There were no comments by Somewhat Familiar respondents concerning the barrier, *Management Mobility*. This is reflected in Table 4-5, Top 1 Barrier Ranking.

4. Analysis of the Characteristics

According to the respondents in this study, *Management Mobility* has several symptoms, most of which relate to its time influence on decision making and planning. The Expert comments indicated that managers who know that their stay in a position is short term, act much like politicians who are vote seeking, except that managers are seeking quick results to impress their superiors (their constituency). Very Familiar respondents point out that this barrier does not maintain the constancy of purpose within an organization. Furthermore, the respondents infer that this barrier may even inhibit the origin of constancy of purpose within an organization due to its detrimental effects on forward thinking. Such planning for constancy of purpose is seen as unnecessary, especially when the previous regime was perceived successful by managing the numbers, vice exercising leadership.

Deming relates the same conclusions, that *Management Mobility* fosters quick results and annihilates teamwork within an organization (does not maintain constancy of purpose). He names this barrier as one of his Deadly Diseases which potentially block implementation of the cultural change that management is responsible for initiating and maintaining. The job of management is inseparable from the welfare of the enterprise, Deming says [Ref 8:p. 120-121]. But how can a manager view his operation in the long term prospective, when the system he operates within drives him to short term thinking, i.e., pleasing the boss at all costs?

One Very Familiar respondent indicated that managers regard management by the numbers (or process), as leadership. They manage with an audit mentality of oversight, traditionally deemed leadership.

The respondents in this study seem resigned to this barrier as a fact of business within the Government and the defense industry. Only one solution to overcoming this barrier was presented by the respondents. That solution focused on the prerequisites of new managers entering an organization in leadership positions. The proposal is that managers entering leadership positions should receive training in TQM principles prior to entering new positions. This would at least provide an assurance to the workforce that some semblance of constancy of purpose will be maintained.

5. Summary of the Barrier, Management Mobility

The results indicate that *Management Mobility* reduces the manager's tendency to make decisions that are long-term in nature, vice optimization of factors for short-term personal success. The bottom line is that management mobility naturally induces a short-term results mentality because the manager knows that his success is based on his boss' perception of his performance, which has traditionally been viewed as responsiveness for quick results.

To overcome this barrier, the solution provided by respondents was as follows:

- Respondents indicated that new managers or leaders should receive TQM training prior to assuming the leadership role.

H. CHAPTER SUMMARY

This chapter analyzed the six barriers that were ranked as the most significant by the questionnaire respondents. The barriers were as follows: *Management Willingness to Change*, *CICA*, *Congressional Oversight*, *DoD Acceptance and Inspection Procedures*, *Single Year Budgeting*, and *Management Mobility*.

These barriers represent a cross section of cultural boundaries, political inhibitors, and statutory confinements, all of of which affect the successful implementation of TQM in the DoD acquisition system. Deming would likely say that as goes management, so goes the rest. If management were to approach implementation with a profound understanding of the key elements would naturally come under control.

Management Willingness to Change was viewed as the most significant barrier. This illustrates the fundamental shift in management's understanding and support for TQM which still must occur before many of the other less significant barriers can be reduced.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The Philadelphia Area Council for Excellence (PACE) Quality Round Table Companies in Philadelphia originally outlined nine phases to bring about change under Deming's quality concepts. Institutionalization was phase nine: Institutionalization "occurs when all of Deming's Fourteen Points are the natural way to carry out operations. Pervasive, never-ending improvement, with a constancy of purpose is a way of life". [Ref. 6:p. 206]

The objective of this research was to determine what barriers stand in the way to institutionalization of TQM in the DoD acquisition system, which of the barriers are the most significant, and finally, determine how those barriers might generally be overcome.

B. CONCLUSIONS

1. Significant barriers exist which threaten institutionalization of TQM in the DoD acquisition system.

There are many barriers to institutionalization of TQM in the acquisition system. The six most significant barriers determined in this study were: *Management Willingness to Change, The Competition in Contracting Act of 1984, Congressional Oversight, DoD Acceptance and Inspection Procedures, Single Year Budgeting*, and *Management Mobility*. These barriers were identified from the research questionnaire and were analyzed in Chapter V. Other barriers were

identified in this study; however, the six barriers analyzed herein closely represent where leadership should place emphasis for the resolution of impediments.

2. Institutionalization of TQM involves a cultural shift in how managers view leadership.

This study concludes that top management creates the environment for total quality concepts to flourish. Respondents in this research indicated that top management tends to lead to managing inspections and budgets. This is not to say that these elements do not have a place; however, they should not be preeminent. As brought out in Chapter V, the system that DoD managers work within demands of them attention to this method of leadership. The system does not demand, nor does it reward quality and continuous improvement. Only top management has the ability to create systems that encourage others working within the system to manage with the customer in mind.

3. Barriers rooted in statute or regulations demand leadership's attention.

Some barriers might be overcome by changing law or regulations. These barriers represent externally controlled barriers and internally controlled barriers. The environment that has evolved into what is known as the DoD acquisition system is affected by both impediment types.

Statutes such as the Competition in Contracting Act of 1984, and a myriad of regulations which do not fundamentally fit with total quality concepts, must be effectively challenged for their total quality contribution(s) or non-value

added costs. If fundamental and systemic transformations are not initiated, the environment for total quality will not proceed beyond assisting to improve process oriented operations.

4. **A prerequisite qualification for military and civilian command positions must include a profound understanding of total quality.**

Management's transient behavior throughout the DoD will be difficult to improve in the short-term; however, emphasis on insisting that military command, or senior civilian positions, require a profound understanding of total quality concepts prior to entering organizational leadership positions, would raise the level of top management to total quality. This increase in commitment would be perceived by the workforce. A cadre of staff who understand total quality is necessary. But they cannot be relied upon to cultivate the required environment. Top management relinquishing responsibility for total quality to a staff of advocates portends likeness to a business-as-usual atmosphere.

5. **The political environment, which thoroughly influences the DoD acquisition system, also affects DoD's ability to institutionalize total quality.**

This study concludes that the political environment that frames the DoD acquisition system must be recognized and accepted by those in DoD who profoundly understand TQM. The potential or realism associated with overcoming some barriers differs widely between others. For instance, it is unlikely that *Congressional Oversight* will lessen in the near future. Expert total quality

advocates in this study pointed out that it is Congress' fiduciary responsibility to oversee the expenditure of funds. They also point out that Congress must be co-opted in the implementation of total quality concepts in the DoD acquisition system. Likewise, Congress must recognize (as indicated by respondents very familiar or somewhat familiar with TQM concepts) that too much oversight enhances an image of distrust, thereby reinforcing a protectionist mentality by DoD managers against Congress. There is too much competition between Congress and DoD, and not enough cooperation. Overcoming this requires a profound understanding of total quality by DoD *and* Congress.

Another aspect of the political environment involves the competitive essence of political survival, i.e., politician's must compete for votes and oft times the DoD acquisition system becomes the platform. Overcoming this barrier may involve the adoption by either party of a platform which openly advocates total quality concepts for use in industry and Government.

6. Enhancement of Government customer and contractor supplier long term relationships is required if total quality is to be institutionalized within DoD.

Numerous studies have sought to determine what levels of profit on defense contracts are both reasonable and stimulate investment within the defense industrial base. The analysis in Chapter V shows that profit may not have the effect on business investment behavior as now currently believed. Respondents herein indicated that longer term buyer-supplier relationships would stimulate greater investment in manufacturing capabilities. The study showed that short

term relationships are systemic in nature due to the *Competition in Contracting Act of 1984* and *Single Year Budgeting*. Furthermore, a reduction of only one of these barriers may not be enough to reduce the symptom: a short-term buyer-supplier relationship.

The study also highlights the conclusion that the quality of products bought by DoD will increase when the number of suppliers is reduced. Best value contractors who practice both product and process improvement would be rewarded with longer term business relationships with the DoD.

C. RECOMMENDATIONS

1. The top management in DoD should fully embrace the entire concept of TQM with a particular emphasis on leadership and commitment.

Without leadership and commitment by management, TQM will fail as just another program. The researcher, in the course of study, found poor orientation by peers who perceived that they had learned everything there is to TQM. Students were turned-off by speakers who tried to *sell* TQM to them. They wanted to see concrete examples of top management living out TQM. Top management must provide leadership and commitment for continuous improvement and educate all regarding the long term, serious, nature with which TQM must be viewed. Top management must be able to articulate organizational missions with a profound understanding of TQM. It cannot be learned in a three hour training session. Top DoD management, and top Service management must continue to support the cultural change implied by TQM. Management must not

lose the long term perspective, that the cultural change may take several decades to come to fruition within DoD.

2. **DoD acquisition commands should use tailored questionnaires, much like the one in this research, to obtain definitive feedback from employees regarding the implementation of TQM.**

The study of barriers within an organization is imperative in determining the progress of implementing TQM. The results of such a survey should not be utilized to tamper with acquisition management practices, but rather enable management to see shortcomings of the implementation process.

3. **New acquisition policies or initiatives should be evaluated and presented to the defense establishment under the umbrella concept of TQM.**

Contractors and Government personnel should not perceive changes as just other programs that they are forced to comply with. If a new policy, regulation, or program is initiated, it should be clearly articulated in such a manner as to make it apparent as to how it fits with TQM principles. Top management must be willing to enforce the TQM umbrella concept for acquisition policy analysis.

4. **DoD leaders in conjunction with professional and industry associations should take every opportunity to involve politicians (national, state, and local) and their staffs in TQM education.**

This might be accomplished by inviting key Congressional members to seminars and symposia relating to total quality. In addition, education of the public in appropriate forums will increase constituency concern for total quality concept in applied government.

5. **The Competition in Contracting Act should be reviewed for those elements which are counter to or inhibit TQM and appropriately modified.**

The researcher does not recommend efforts to immediately repeal the Competition in Contracting Act of 1984. The following recommendations are made regarding the barrier that CICA represents:

a) A more comprehensive study should be performed to determine the full extent that CICA represents a barrier to TQM.

b) Study the steps that DoD can take to establish long term relationships with suppliers within the present CICA requirements.

c) Competition "savings" as indicated by the Services' Competition Advocate Generals should be balanced with studies to find the *costs* of competing.

6. **Defense Contract Management Command programs, such as In-plant Quality Evaluation (IQUE), should continue implementation.**

Initiatives that foster longer term buyer-supplier relationships and contractor improvement of product and processes will show Government commitment and institutionalize TQM concepts. The results (costs) of such initiatives should be maintained and analyzed. Other DoD Agencies should adopt IQUE concepts.

7. **Advancement and rewards for individuals should be tied to the long range goals of the organization.**

A viable rewards structure, with a TQM basis, should be linked to long range organizational goals. Under the current system for both military and civil service employees, incentives are linked only to short term actions, not long term contributions to an organization. The rewards systems that really count, promotions, are not linked to total quality concepts and do not therefore induce TQM behavior to the fullest extent.

D. RESEARCH QUESTIONS

1. **What is the concept of TQM, principally as approached by Dr. W. Edwards Deming? What is DoD's concept?**

Deming does not refer to the quality philosophy that he teaches as TQM. Deming teaches a holistic manner of continuous improvement based on what he terms, Profound Understanding, i.e., Appreciation for a System, Statistical theory (theory of variation), a theory of Knowledge, and a theory Psychology. Deming

developed the concept of Profound Understanding, the 14 Points, and the Deadly Diseases so that American, analytic thinkers, could grasp the elements of holistic thinking that Japanese business applied naturally.

DoD appears to conceptualize and teach TQM as a tool to be used in implementing various process strategies. DoD does not currently stress that people must be involved in a cultural change in order to view the world differently. DoD's emphasis thus far has only been on improving the process.

2. How does TQM differ from traditional management concepts currently practiced by DoD?

DoD is in a transitional phase regarding use of applied TQM concepts in management. TQM as it applies to the acquisition system is focusing much needed attention on the quality and desirability of the product received from contractors. DoD acquisition managers are beginning the move from reliance on the final product inspection to in-process product testing and inspection. Application of TQM to strategic business management practices within the DoD acquisition system, have not yet begun, e.g., linking TQM to the PPBS system.

3. What statutes, regulations, policies, or work ethics act as the most significant impediments to institutionalizing TQM concepts in the DoD acquisition process?

The principal impediments to institutionalization of TQM as discussed herein were: *Management Willingness to Change, The Competition in Contracting Act of 1984, Congressional Oversight, DoD Acceptance and Inspection Procedures, Single Year Budgeting*, and *Management Mobility*. Other impediments identified

in the study included: *Training*, *DoD Specifications*, *Contractor Cost Recovery Systems*, *Ethics*, *Socio-economic Programs*, *Labor Unions*, the *Buy American Act*, and *OMB Circular A-109*.

4. **How might the impediments or barriers be reduced or eliminated?**

Management Willingness to Change was determined to be the most significant barrier to institutionalization of TQM in the DoD acquisition system. This illustrates the fundamental shift in management's understanding, commitment, and support for TQM which must occur before many of the other less significant barriers can be reduced. Profound understanding and commitment to total quality concepts, along with leadership by top management are the three main ingredients to overcoming most of the impediments facing institutionalization of TQM in the DoD acquisition system.

E. SUGGESTIONS FOR FURTHER RESEARCH

1. Study the economic differences between cooperation and competition as described by Deming. Is cooperation rather than competition really a different economic system, or is it a variation of supply and demand economics? Review of antitrust laws and their impact on the DoD acquisition system would be appropriate.

2. Study specific statutes that are acquisition system related TQM barriers. Analyze the statutes separately to determine exactly the legal foundation for that barrier. Study also the original intent of the law to determine if the original intent can be rationally preempted using TQM concepts. Start with the Competition in Contracting Act of 1984.

3. Study the link between long term buyer-supplier relationships and contractor investment levels. Is there a stronger link between the length and non-adversarial relationship versus the level of profit on shorter term contracts?

4. Study how to apply TQM as a tool for strategy development and compare the results to TQM as a tool for implementing strategy. Can any strategy be implemented applying TQM principles? Is a profound knowledge of TQM necessary to develop a strategy that will eventually be implemented using TQM? What are the implications for acquisition strategy planning?

5. Perform a follow-on study to determine if Management Willingness to Change remains the top barrier after some period of time. Remember that different ways of measuring produce different results.

APPENDIX A

RESEARCH QUESTIONNAIRE

SUBJECT: **BARRIERS TO IMPLEMENTING *TOTAL QUALITY MANAGEMENT* (TQM) PRINCIPLES IN THE DOD ACQUISITION PROCESS**

DISCUSSION: TQM is the management philosophy espoused by the Department of Defense. This management philosophy portrayed by Dr. W. Edwards Deming in his Fourteen Points, conflicts with many of DoD's acquisition and non-acquisition related regulations, policies, and congressionally imposed statue(s).

PURPOSE: The purpose of this study is to gather data which reflect the opinions of government and industry business decision makers who are knowledgeable of Dr. Deming's Fourteen Points and the DoD acquisition process. Specifically this questionnaire will seek to identify impediments based on *statute, regulation or policy*, that stand in the path of DoD towards fully implementing TQM. It is recognized that DoD's definition of TQM and the Fourteen Points do not entirely match, however, in order to provide a common basis from which to characterize TQM, Dr. Deming's Fourteen Points and Deadly Diseases are utilized herein.

For reference, Deming's 14 points are as follows:

1. Create constancy of purpose for improvement of product and service.
2. Adopt the new philosophy
3. Cease dependence on inspection to achieve quality.
4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier.
5. Improve constantly and forever every process for planning, production, and service.
6. Institute training on the job.
7. Adopt and institute leadership.
8. Drive out fear.
9. Break down barriers between staff areas.
10. Eliminate slogans, exhortations, and targets for the work force.
11. Eliminate numerical quotas for the work force and numerical goals for management.
12. Remove barriers that rob people of pride of workmanship. Eliminate the annual rating or merit system.
13. Institute a vigorous program of education and self-improvement for everyone.
14. Put everybody in the company to work to accomplish the transformation

In addition, Dr. Deming points out the Deadly Diseases which impact on the success or failure of implementation of the Fourteen Points (it is recognized that several of these are societal in nature):

1. Lack of constancy of purpose to plan product and service that will have a market and keep the company in business, and provide jobs.
2. Emphasis on short -term profits.
3. Evaluation of performance, merit rating, or annual review.
4. Mobility of management; job hopping.
5. Management by use only of visible figures, with little or no consideration of figures that are unknown or unknowable.
6. Excessive medical costs.
7. Excessive costs of liability, swelled by lawyers that work on contingency fees.

REQUESTED ACTION: It is requested that the survey be completed by an expert familiar with DoD's acquisition process, as well as familiar with Dr. Deming's quality concepts. Quality responses by expert opinion will be highly regarded.

SECTION I - DEMOGRAPHICS

- Name (optional) _____
- Organization _____
- Job Description/Title _____
- No. years acquisition experience _____
- Familiarity With TQM Concepts (please check one):

_____ Expert
_____ Very Familiar
_____ Somewhat Familiar
_____ Unfamiliar Concept

Note: If you marked Expert or Very Familiar, please briefly explain your exposure to Dr Deming's concepts:

_____

- Would it be acceptable to contact you for a short telephone interview for clarification purposes?

_____ YES • Phone _____

_____ NO

SECTION II - BARRIER IDENTIFICATION

Below are listed often cited barriers to implementing TQM in the DoD acquisition process. In completing this section please select either *YES* or *NO* to indicate whether or not you perceive the listed category to be a barrier to successfully implementing TQM in the DoD acquisition process. IF YOU CHOOSE YES, INDICATE, BY NUMBER, THE SIGNIFICANCE OF THAT BARRIER BY USING THE FOLLOWING MEASURES:

1. NOT SIGNIFICANT
2. SOMEWHAT SIGNIFICANT
3. SIGNIFICANT
4. VERY SIGNIFICANT
5. INSURMOUNTABLE

Also, please list whether a barrier is primarily driven by Government Law or Regulation (*GLR*), Internal Policy (*IP*), or Neither (*N*).

Barrier	*YES*	*NO*	*Don't Know*	*GLR / IP / N*
1. *Management Willingness to Change*	___	___	_____	_____
2. *Competition in Contracting Act of 1984*	___	___	_____	_____
3. *Buy American*	___	___	_____	_____
4. *DoD Acceptance and Inspection Procedures*	___	___	_____	_____
5. *DoD Specifications*	___	___	_____	_____
6. *Industrial Base Concerns*	___	___	_____	_____
7. *Contractor Cost Recovery Systems*	___	___	_____	_____
8. *Ethics*	___	___	_____	_____
9. *Training*	___	___	_____	_____
10. *Socio-Economic Programs*	___	___	_____	_____
11. *Industry Labor Unions*	___	___	_____	_____
12. *Congressional Oversight*	___	___	_____	_____
13. *Single Year Budgeting*	___	___	_____	_____
14. *Management Mobility*	___	___	_____	_____
15. *OMB Circular A-109*	___	___	_____	_____

Please list other significant categories you feel are barriers:

16. _____ ___ ___ _____ _____

17 _____ ___ ___ _____ _____

18. _____ ___ ___ _____ _____

SECTION III - BARRIER RANKINGS

In this section, please rank the five (5) barriers you perceive to be the most significant towards impeding implementation of TQM concepts in DoD's acquisition process.

(Please place the *Barrier* number from SECTION II in the space provided.)

1st Most Significant Barrier _____

2nd Most Significant Barrier _____

3rd Most Significant Barrier _____

4th Most Significant Barrier _____

5th Most Significant Barrier _____

SECTION IV - TOP BARRIER OPEN EXPLANATION

In this section, please choose the two categories, which to you, represent the *most significant barriers* to implementing TQM in the DoD acquisition process. Along with naming the categories please briefly explain *why* you perceive these barriers as the most significant and *how* these barriers might be overcome. Discussion of professional experience and insights are respectfully requested in this section *(please use additional space if needed)*.

BARRIER 1 (*Why* is this barrier significant, and *how* might it be overcome?):

BARRIER 2 (*Why is this barrier significant, and how* might it be overcome?):

APPENDIX B

QUOTATIONS FROM EXPERT RESPONDENTS CONCERNING THE BARRIER: MANAGEMENT WILLINGNESS TO CHANGE

Management's willingness to change has been identified as one of the Key Barriers in implementing a Total Quality Management Program. TQM , as in all organizational changes, is viewed by management as a threat to their operations. Managers who have been rewarded and promoted in the past for following a certain philosophy are now being required to change that philosophy. Because management controls 85 to 95 percent of a company's operation/processes, they significantly influence the type of change, the direction of the change, and how fast change can be implemented. The only way to overcome this barrier is through education. Managers must fully understand the new philosophy and what is expected. The message that must be transmitted, is that in the future managers who follow the new philosophy will be the individuals who will be rewarded and promoted.

U.S. managers still believe that they are inherently superior to managers in other nations. This arrogance is found in senior managers in the military, in the defense industry and in commercial industry. I have worked in all three areas. Only time, education and threats to an organization's survival will change this.

Change in attitude and behavior of managers is required, especially higher level managers. Most senior managers have been judged successful and therefore have little felt need to change. This can be overcome in a significant way with only a proportion of them. It takes some combination of education, persuasive staff, peer influence, supervisor influence, and compelling examples that they can relate to.

Leadership is what makes the process work and provides the positive environment for value added efforts. However, I have experienced significant reluctance on the part of leadership to make TQM a way, to cultivate a

creative and holistic approach to improving processes. This most important category will take years, probably decades to truly change.

TQM can work only if top management is committed and creates an environment where TQM can flourish (e.g., individual respected, fear removed, good ideas encouraged, willingness to change, etc.). In order to overcome this barrier, management must go through a conversion process and become TQM advocates. TQM training and exposure to success stories from government and private industry can help to overcome this barrier. Attendance at "GOAL" (Growth Opportunity Alliance of Greater Lawrence) and "PACE" (Philadelphia Area Council for Excellence) seminars are good examples of where success stories can be heard.

Great difficulty finding a decision maker. Bureaucrats (are) more interested in personal reputation vs. good of the government. Lots of talk, but not backed up with resources and personal commitment over the long term. The government does not measure (quantify in dollars) the cost of unquality. To overcome: 1) issue directive with "teeth", 2) supported by appropriate TQM training, 3) make it part of the organizational management system to identify unquality cost and manage its reduction.

Constancy of Purpose (management related). It is relatively easy to state that quality is most important, but very hard to stick to when a person is being measured on short-term performance, dollars saved, speed of delivery...When pressure is on, what will happen? Also, is the purpose clear and accepted by all DoD officers? Or is each one doing his "own thing", calling it DoD policy?

Poor Environment (management related). Environment is vital to TQM success. Simply issuing an instruction requiring TQM implementation doesn't get the job done. People can only be converted through example, where managers follow through with actions that support the written instructions. Employees can quickly identify hypocritical behavior by management. This barrier can be overcome by management adopting and living up to the TQM principles on a daily basis. When employees realize that the environment has really changed, then TQM implementation can begin in earnest and real progress can be made.

Communication (management related). Communication is necessary to convey information from the top to the bottom. To convey feedback, customer concern, sharing information that results in reducing waste. Improving communication is difficult; the barriers between commands, divisions, officers, individuals, is beyond belief. The idea that the more information you have that no one else has makes you more important to the process has made us a country of individualists. We must overcome this reluctance to communicate and cooperate and understand that in the 21st century, communications will make the difference in failure or success.

APPENDIX C

QUOTATIONS FROM EXPERT RESPONDENTS CONCERNING THE BARRIER: COMPETITION AND CONTRACTING ACT OF 1984

CICA requires multiple sources and fosters carrying poor quality contractors instead of developing relationships with proven contractors who deliver high quality, timely products and services. Amend CICA and do not continue internal policy that makes CICA more restrictive than laws require.

Here again the mere fact that one must always take the low bidder will destroy any attempt to cultivate long term relationships with suppliers. Adversarial relationships are the norm under the guile of always awarding the low bidder. How to overcome this barrier? Again, education is a partial answer. The law should be amended to allow for long term relationships to be established and contracts should be awarded on quality as well as price. The total cost to the system should be the controlling factor rather than price.

Competition within the same industry leads to the waste of scarce resources by duplicated researches performed in various companies without any coordination. Also competition in price cutting in the bidding systems guarantees the deterioration of quality. Antitrust regulations must be totally rewritten.

CICA has made it extremely difficult to make changes in the acquisition process. There are so many rules, regulations, and restrictions, that it is virtually impossible to change the process without changing the law. Although (DoD activity) made some minor changes to the internal process by changing the priority system, they were unable to influence vendor selection, vendor performance (which included delivery dates), and the quality of the items.

APPENDIX D

QUOTATIONS FROM EXPERT RESPONDENTS CONCERNING THE BARRIER: CONGRESSIONAL OVERSIGHT

Congress is a major influence in the DoD acquisition process. Major changes cannot be made to the acquisition process without the backing of key people in Congress. Until these key people understand and embrace total quality approaches, it will be impossible to introduce major cultural and systems changes required.

The Congress micro manages and with great justification; cost over-runs, Ill Wind, etc., etc.. TQM/Deming places much emphasis on trust and ethical behavior. The Congress has a fiduciary responsibility to the U.S. taxpayer - it will be hard to give up oversight given the problems of the last 20 years. I have no solution other than DoD/defense contractors doing better and being more open with the Congress; B-1 cost overrun disclosures (or lack of) is a prime example.

Congressional Oversight coupled with Single Year Budgeting: This combination does not allow for the cultivation of long term suppliers who could install cost saving processes and better controlled processes if they knew that they would still be a supplier when this contract is over. How to overcome this barrier? Education is a start. Convincing a self-serving politician that he should look at the whole rather than count votes is difficult. Education of the general public on not accepting shoddy buying practices may be a start, but I see this as a major stumbling block. We have few examples within private industry to enhance any sort of change.

APPENDIX E

QUOTATIONS FROM EXPERT RESPONDENTS CONCERNING THE BARRIER: DOD ACCEPTANCE AND INSPECTION PROCEDURES

We need to improve our processes and get those who are part of the process to act as owners. Individuals must each be responsible for inspecting their own work. Must not rely on tailgate inspection procedures.

DoD acceptance and inspection procedures affects letting the contractor control processes and manage by processes. (This barrier) adds unnecessary cost and fosters lack of trust and common sense supplier operation/relationships. Move rapidly toward total IQUE concepts.

The use of AQL's (average quality limits) allows contractors to sell defects to the government and inhibits willingness to improve. Allowing profit to contractors for scrap and rework costs inhibits willingness to improve processes. Lack of good operation definition in government specification leads to poor inspection and bad quality. Use of SPC and Cpk's as substitution for and augmentation of existing inspection requirements, eliminate use of AQLs, stop paying contractors profit on scrap and rework!

APPENDIX F

QUOTATIONS FROM EXPERT RESPONDENTS CONCERNING THE BARRIER: SINGLE YEAR BUDGETING

Single year budgeting does not foster long term process improvements. It fosters just getting the job done with the minimum quality required. Investment in better tools and training is hard to justify.

Single year budgeting [for TQM training] has a detrimental impact on long term improvement. TQM training and implementation does not extend into multiyear needs like hardware procurement. Some method must be provided for approval of funding up to 3 years. This allows an organization to develop and implement a long term strategy. To overcome: allow TQM funding to cover TQM strategy period; verify by monitoring cost.

Congressional Oversight coupled with Single Year Budgeting: This combination does not allow for the cultivation of long term suppliers who could install cost saving processes and better controlled processes if they knew that they would still be a supplier when this contract is over. How to overcome this barrier? Education is a start. Convincing a self-serving politician that he should look at the whole rather than count votes is difficult. Education of the general public on not accepting shoddy buying practices may be a start, but I see this as a major stumbling block. We have few examples within private industry to enhance any sort of change. (This statement was previously quoted in Appendix C.)

APPENDIX G

QUOTATIONS FROM EXPERT RESPONDENTS CONCERNING THE BARRIER: MANAGEMENT MOBILITY

Management mobility leads to short-term decision making. If I am to be measured on my two years in this position, I need something to show during those two years. What happens later has no effect on my rating, rank, or compensation. This has been made clear to me by 2 generals who expressed interest in learning more about TQM - they want short-term visible results that can be documented or they are not interested.

We continue to rotate our senior acquisition management cadre (military) in two year (or less) cycles. Each new manager is unwilling to change what his predecessor has done especially if he (the predecessor) was not unsuccessful. Because the assignment is short term, there is no long term constancy of purpose, but simply a survival mentality. This discourages forward thinking. There is a disproportionate focus on managing the process vice exercising leadership. (Quote taken from a Very Familiar respondent.)

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